


CHAPTER 3:
Travel Demand Forecasting

CHAPTER 3: TRAVEL DEMAND FORECASTING

The method and process developed to predict growth in the Whitefish area over the next twenty years is described in this chapter of the Transportation Plan. Using population, employment and other socio-economic trends as aids, the future transportation requirements of the Whitefish area was defined. A model of the transportation system of the Whitefish area was built, and the additions and changes to the system that are projected to occur over the next twenty years were entered into the model to forecast the future transportation conditions. From this, various scenarios were developed to test a range of transportation improvements to establish their affects on the transportation system.

3.1 SOCIOECONOMIC TRENDS

Motor vehicle travel growth is directly correlated to population and economic growth. In the greater Whitefish area, this is also supplemented by the large influx of tourist travel throughout the year. Recently, population growth has experienced a significant climb. This is evidenced by the extreme growth that occurred in Flathead County between 1990 and 2000, and accounted for a 25.8 percent increase in Flathead County population growth alone. **Table 3-1** shows that from 1970 through 2000, the county's population almost doubled, increasing by an estimated 35,011 persons. In 2005, the county's population is estimated to be 83,480. Likewise, the county's employment data indicate an increase of 33, 651 jobs, more than double that exhibited in 1970. **Figure 3-1** shows the Flathead County population and employment trends between 1970 and 2005 (estimated) in a graphical format.

Table 3-1

Flathead County Population and Employment Trends (1970-2005)

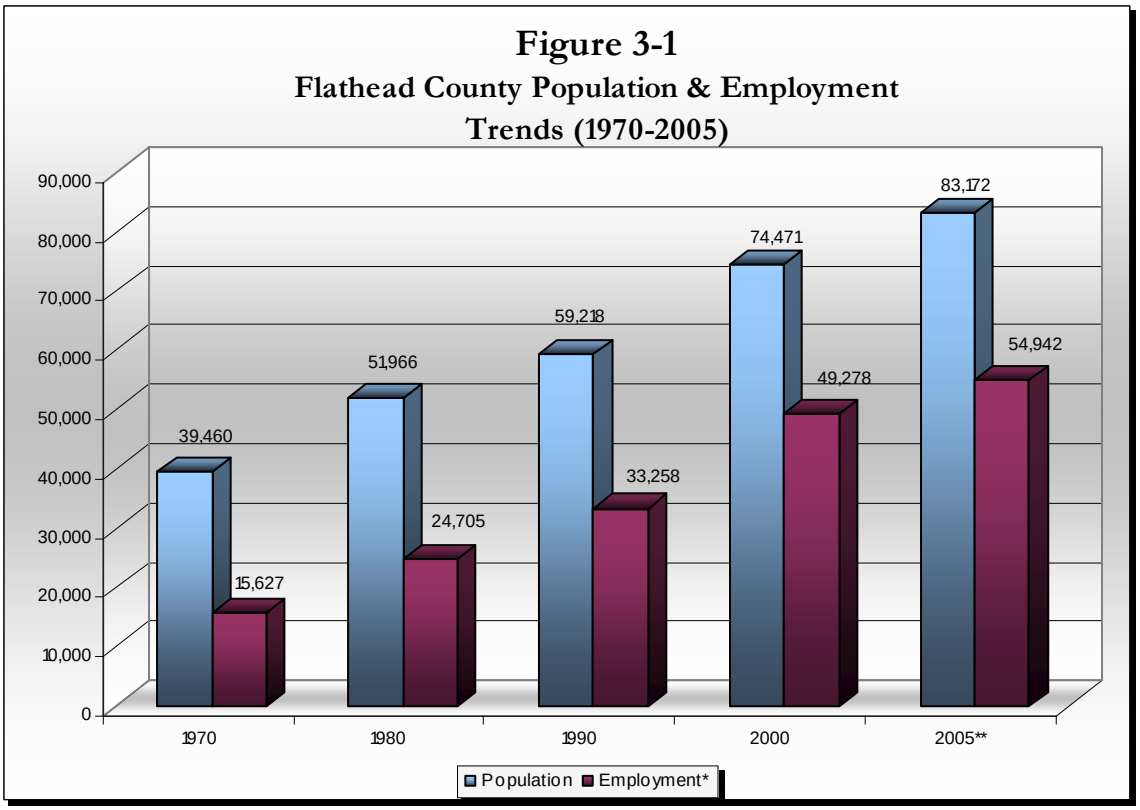
Year	Population	Employment*
1970	39,460	15,627
1980	51,966	24,705
1990	59,218	33,258
2000	74,471	49,278
2005**	83,172	54,942

Source: US Bureau of the Census, Census of Population (1970 thru 2000)

**Employment data is number of jobs, not number of employed people.*

***Population and employment data for 2005 are estimates.*

Figure 3-1
Flathead County Population & Employment Trends (1970-2005)



These population trends can further be analyzed by examining the amount of population within the cities contained within Flathead County and the incorporated areas (i.e. Whitefish, Kalispell and Columbia Falls), in comparison to the total population of Flathead County. **Table 3-2** shows the historic population trends for the Whitefish area from 1970 through 2005. **Figure 3-2** presents this information graphically.

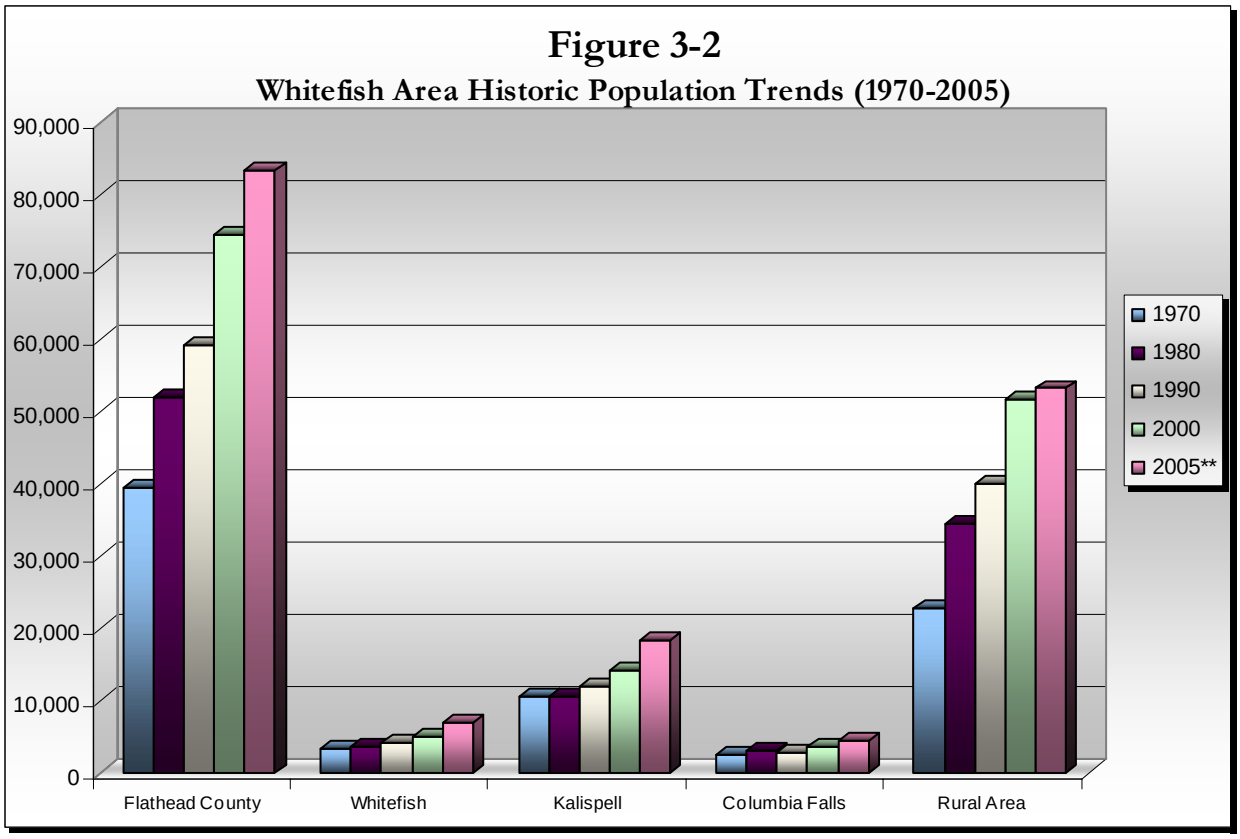
Table 3-2
Whitefish Area Historic Population Trends (1970-2005)

Year	Flathead County Population	City of Whitefish Population	City of Kalispell Population	City of Columbia Falls Population	Rural Flathead County Population
1970	39,460	3,349	10,526	2,652	22,933
1980	51,966	3,703	10,689	3,112	34,462
1990	59,218	4,368	11,917	2,921	40,012
2000	74,471	5,032	14,223	3,645	51,571
2005**	83,172	7,067	18,480	4,440	53,185

Source: US Bureau of the Census, Census of Population (1970 thru 2000)

*** Population data for 2005 are estimates as of July 1, 2005.*

Figure 3-2
Whitefish Area Historic Population Trends (1970-2005)

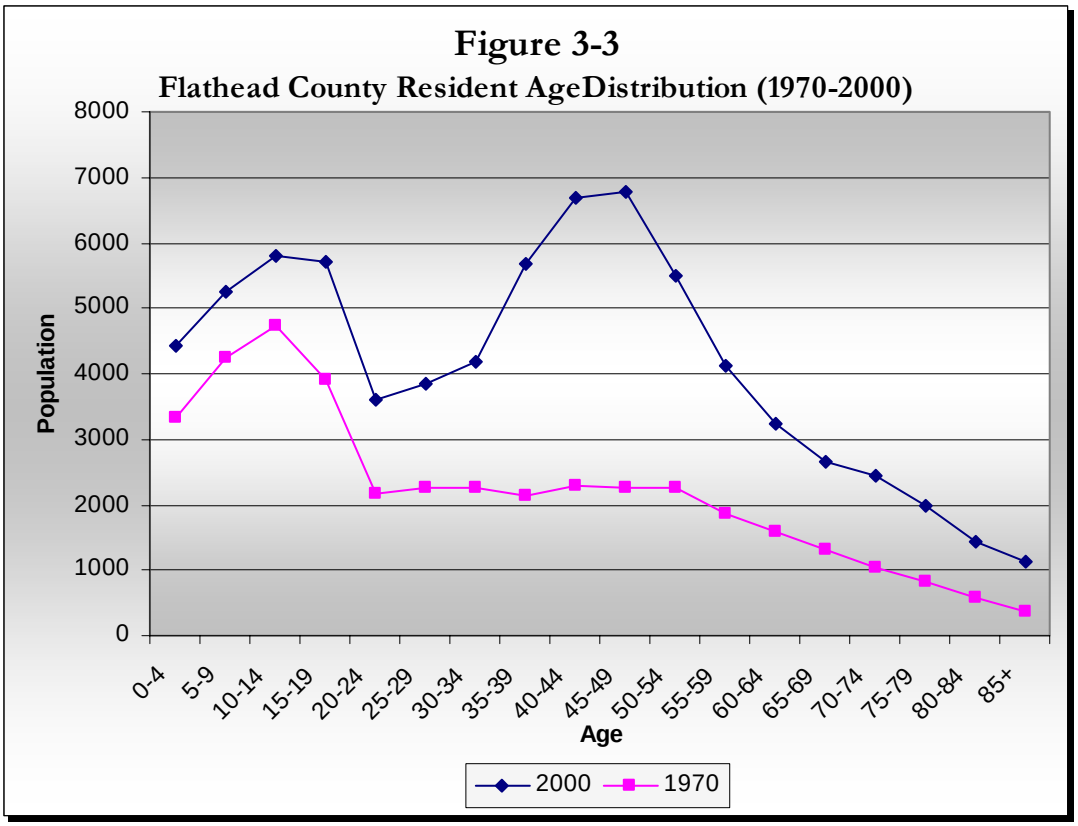


In recent decades there were other notable changes in Flathead County's population. In Flathead County, and elsewhere in Montana and the nation, the population's age profile got older. Between 1970 and 2000, the number of county residents under the age of 16 increased by 3,181 persons, residents age 16 to 64 increased by 26,298 persons, and residents 65 and older increased by 5,532 persons. This can be seen in **Table 3-3**. As "Baby Boomers" got older, they simply had fewer children than their parents. This information is also shown graphically on **Figure 3-3**.

Table 3-3
Flathead County Resident Age Distribution (1970-2000)

Age Group	1970		2000		30-Yr Change
0-15	12,306	31.2%	15,487	20.8%	3,181
16-64	23,030	58.4%	49,328	66.2%	26,298
65+	4,124	10.5%	9,656	13.0%	5,532
Total	39,460	-	74,471	-	35,011

Source: US Bureau of the Census, Census of Population (1970 and 2000)



As seen in Flathead County, the age profile for the City of Whitefish has shifted as well. While age distribution data for the City of Whitefish is not available for 1970 as with Flathead County, **Table 3-4** shows the number of residents between 1980 and 2000 under the age of 16 increased 135 persons, residents age 16 to 64 increased by 987 persons, and residents 65 and older increased by 207. This information is shown graphically on **Figure 3-4.**

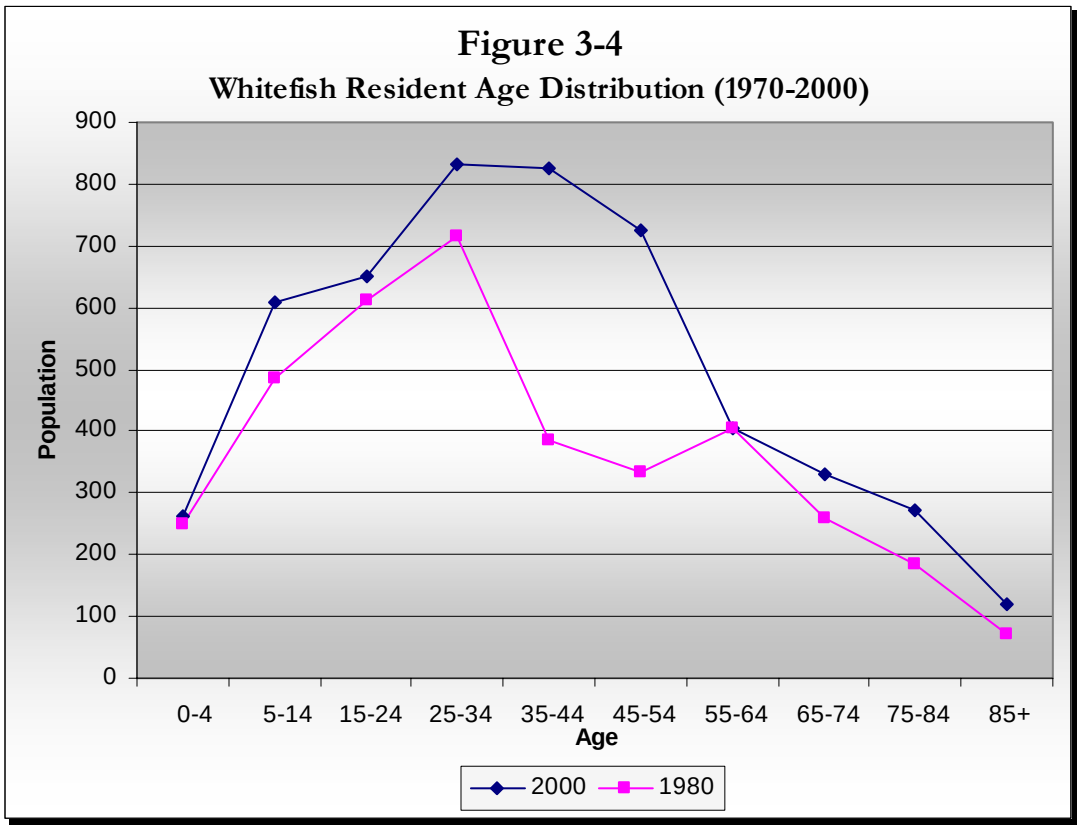
Table 3-4

Whitefish Resident Age Distribution (1980-2000)

Age Group	1980		2000		20-Yr Change
0-15	735	19.8%	870	17.3%	135
16-64	2,452	66.2%	3,439	68.3%	987
65+	516	13.9%	723	14.4%	207
Total	3,703	-	5,032	-	1,329

Source: US Bureau of the Census, Census of Population (1980 and 2000)

Figure 3-4
Whitefish Resident Age Distribution (1970-2000)



In 2000, the Flathead County economy supported an estimated 49,278 jobs. From 1970 to 2000, the number of jobs in Flathead County more than doubled, from 15,627 jobs in 1970 to 49,278 jobs in 2000. **Table 3-5** displays countywide employment by economic sector from 1970 through 2000. This information is shown graphically in **Figure 3-5**.

Another interesting breakdown of employment sectors in Flathead County is as shown in **Figure 3-6**. This graphic presents the Flathead County 2004 Employment, by economic center, as classified by the *North American Industry Classification System (NAICS)*. This figure shows graphically what the highest employment sectors are in the County. Interestingly enough, the retail industry is the largest employment base in the County, followed by construction, health care, tourism and manufacturing rounding out the top five employment categories.

Table 3-5

Flathead County Employment Trends by Economic Sector (1970-2000)

Economic Sector	1970	1980	1990	2000	Change (1970-2000)
Farm Employment	730	975	994	1,124	394
Agricultural Services & Forestry	169	273	501	1,223	1,054
Mining	40	17	95	227	187
Construction	674	1,626	1,925	4,183	3,509
Manufacturing	3,345	4,095	4,127	5,106	1,761
Transportation & Public Utilities	1,327	1,928	1,803	2,205	878
Wholesale Trade	501	862	971	1,198	697
Retail Trade	2,831	4,634	6,443	9,873	7,042
Finance, Insurance & Real Estate	1,115	1,821	2,428	3,850	2,735
Services	2,484	4,969	9,832	15,600	13,116
Federal, Civilian Government	461	743	865	851	390
Military	416	318	459	389	-27
State Government**	307	420	495	551	244
Local Government**	1,227	2,024	2,320	2,898	1,671
Totals	**15,627**	**24,705**	**33,258**	**49,278**	**33,651**

** Includes total full-time and part-time employment.*
*** For the year 1970, state & local government categories weren't separated. Numbers shown are estimates based on percentages observed from 1970 thru 2000.*
Source: US Department of Commerce, Bureau of Economic Analysis, REIS Data Series, 2000.

Figure 3-5

Flathead County Employment Trends by Economic Sector (1970-2000)

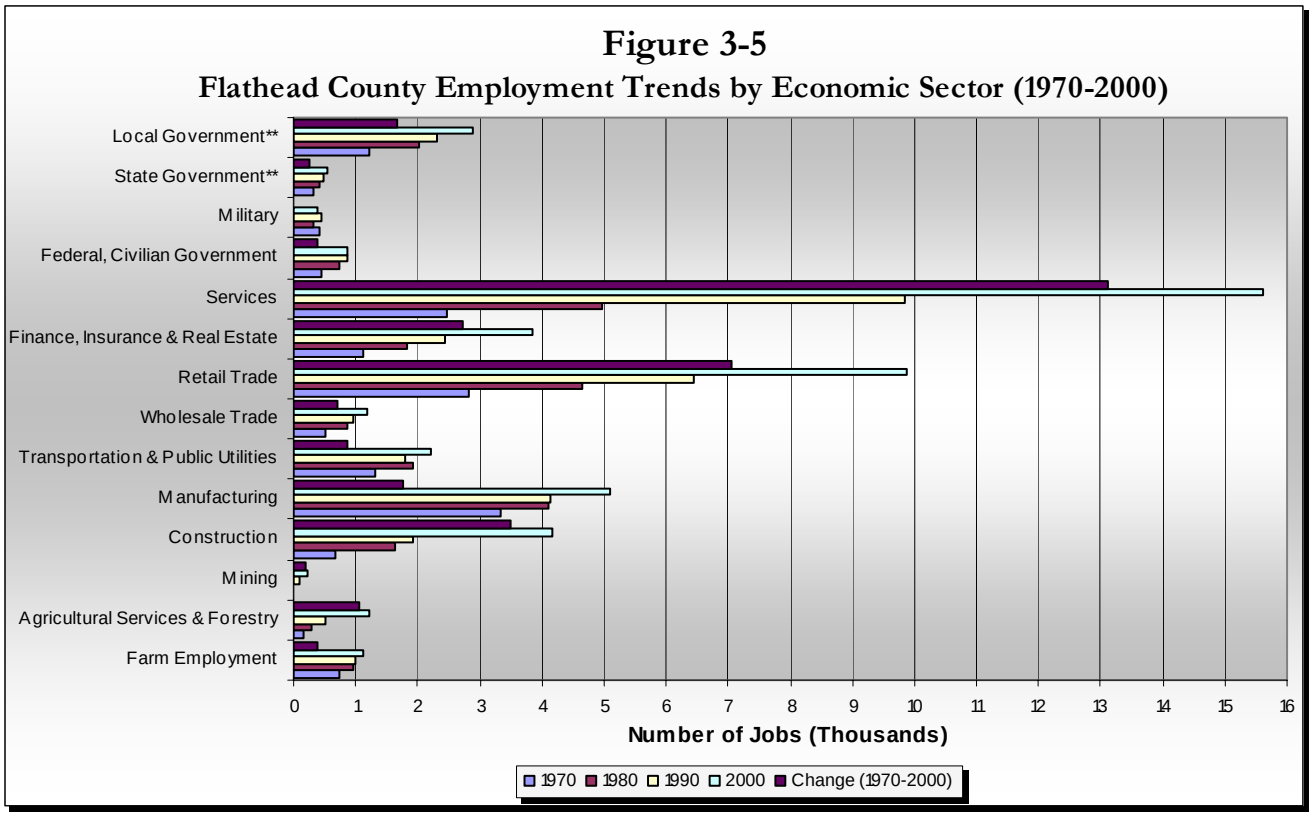
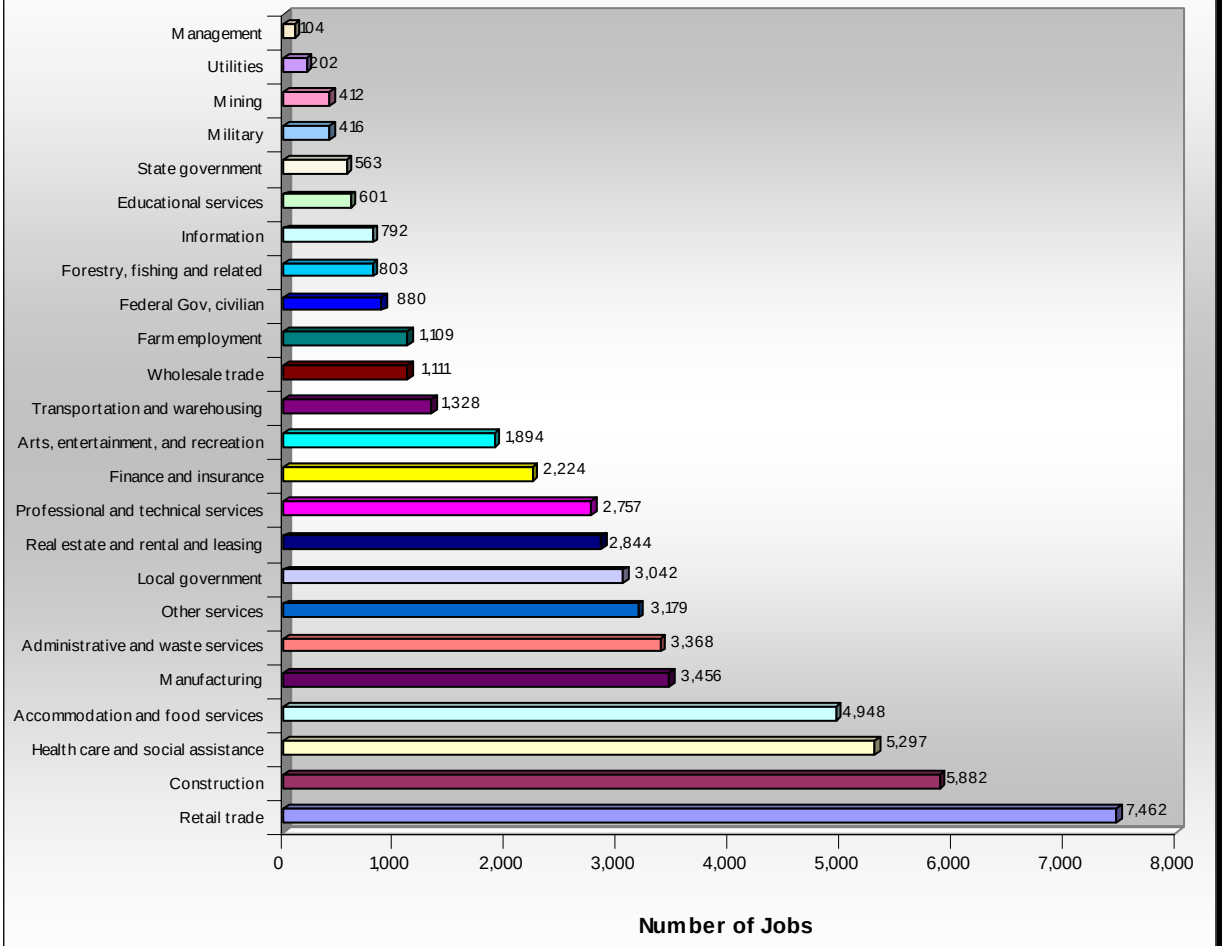


Figure 3-6
Flathead County Employment Trends By NAIC Sector (2005)



While there is not information for the City of Whitefish on the number of jobs available as with Flathead County, the U.S. Census Bureau does keep track of the number of employees in the City. **Table 3-6** shows the number of employees within each economic sector for the City of Whitefish for 1980, 1990, and 2000. This information is shown graphically in **Figure 3-7**. **Figure 3-8** shows the breakdown for employment sectors in the City of Whitefish for 2002. This graph presents for City of Whitefish 2002 number of employees by economic sector. Accommodations and food services is largest employment base in the City followed by retail trade.

Table 3-6
City of Whitefish Employment Trends by Economic Sector (1980-2000)

Economic Sector	1980	1990	2000	Change (1980-2000)
Agricultural, Forestry, Fisheries, Mining	76	47	25	-51
Construction	114	136	180	60
Manufacturing	202	194	171	-31
Transportation	260	199	138	-122
Communication, Other Public Utilities	33	27	64	31
Wholesale Trade	12	22	49	37
Retail Trade	253	400	314	61
Finance, Insurance & Real Estate	50	106	200	150
Business and Repair Services *	8	42	182	174
Personal, Entertainment, & Recreation	160	288	449	289
Professional Services	320	385	529	209
Public Administration	40	18	53	13
Totals	**1,528**	**1,864**	**2,354**	**760**

** Business and Repair Services category changed to Professional, scientific, management, administrative and waste management services.*

Figure 3-7
City of Whitefish Employment Trends by Economic Sector (1980-2000)

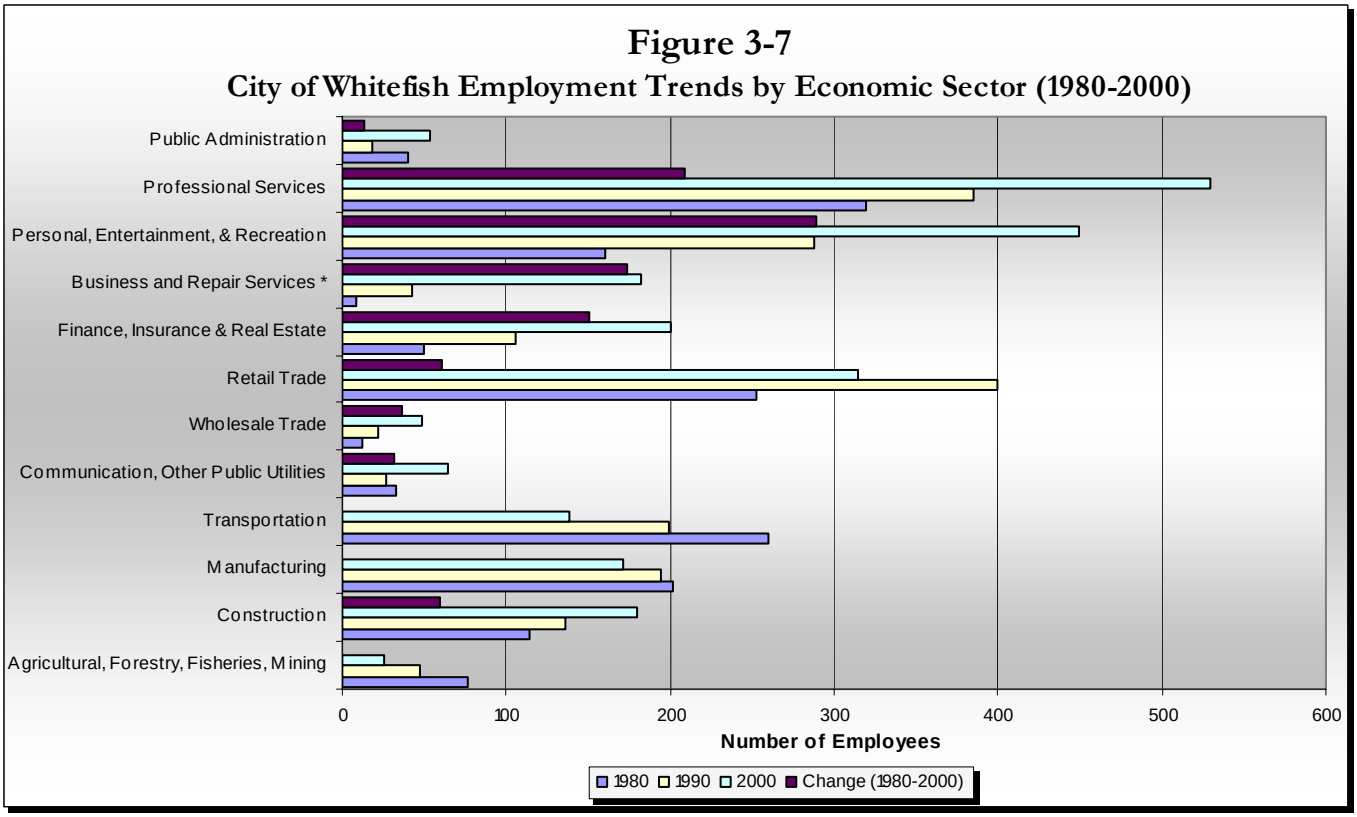
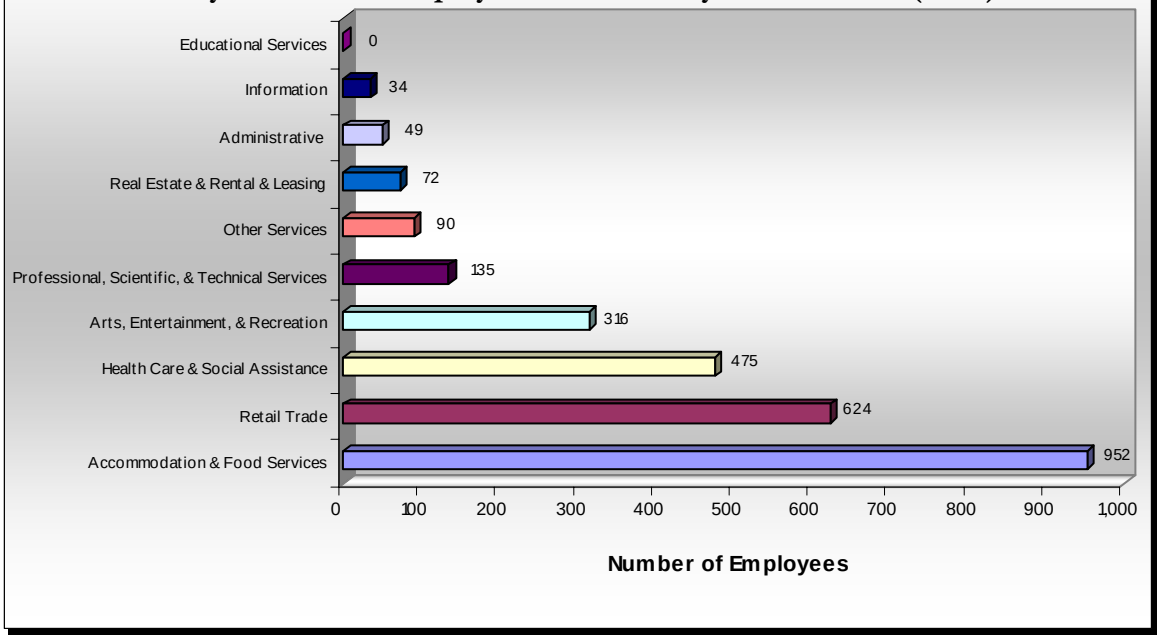


Figure 3-8

City of Whitfish Employment Trends By NAIC Sector (2002)



The economic trend data presented in **Figure 3-7** and **Figure 3-8** is not surprising, given the fact that the retail and tourism sectors are large attractions to the Whitefish area. Many of the top economic sectors are types of business that feed off of this sector and/or are directly dependent on this sector. The healthcare industry is also a booming industry. This trend is seen all over Montana, and is likely to continue. The boom in the healthcare industry especially is a "high-growth" sector both in the state of Montana and nationally. This is partly due to the aging of our population. The employment data presented in this section includes both full-time and part-time jobs. An interesting nuance over the past thirty years has been the change in workforce participation. There are many more women in the workforce now than there were thirty years ago. This relates partly to the change in demographics (families are having fewer children than thirty years ago) and also the availability of part-time jobs. Many part-time jobs include retail and tourism centered jobs, and these positions have attracted a greater proportion of women desiring part-time positions. In some cases, several part-time jobs are held. The fundamental importance of understanding economic trends is that eventually, the numbers and types of jobs equate to vehicle travel on our transportation system.

3.2 POPULATION AND EMPLOYMENT PROJECTIONS

Population and economic projections are used to predict future travel patterns, and to analyze the potential performance capabilities of the Whitefish area transportation system. Projections of the study area's future population and employment are developed from both Flathead County trends (regression line projections), and ongoing Growth Policy updates. These two projection scenarios are provided through the year 2030 (the planning horizon).

The basic scenario that is presented is referred to as the "Moderate Growth" scenario. This is the scenario that is most likely to occur, based on past trends and what has happened in other Montana community's over the past thirty years. This scenario was selected as the basis for the transportation modeling, and represents a continuation of the current population and growth trends already observed as presented in **Section 3.1**, such that adequate services and infrastructure will be planned for if the current levels of development continue. It assumes that the Flathead County population and economy will continue to grow at the same rate it has in the past decade. If this growth rate pattern does not develop further, or is not sustained, then demand will not occur as planned for in this Transportation Plan, and projects may be delayed or avoided. A second scenario was also developed, and is referred to as the "Low Growth" scenario. It builds from much of the population and employment trends that were realized in the 1980's, where economic growth was fairly flat due to many different circumstances. Lastly, a third growth scenario, referred to as a "High Growth" situation, was developed to reflect a more aggressive growth pattern in both population and employment. This growth trend is patterned after population and employment trends that were realized between 2000 and 2005, where economic growth was fairly higher than past years. A breakdown of the population and employment projections produced in each scenario, on a countywide basis for Flathead County, are presented in **Table 3-7** and shown graphically in **Figure 3-9** and **Figure 3-10**.

Table 3-7

Flathead County Population and Employment Projections (2005-2030)

	Low Growth		Moderate Growth		High Growth	
	Population	Employment	Population	Employment	Population	Employment
Year	1.31%	1.00%	1.59%	1.88%	2.23%	4.01%
2005	83,172	54,942	83,172	54,942	83,172	54,942
2010	88,764	57,745	89,675	60,313	92,869	66,877
2015	94,733	60,690	97,127	66,210	103,696	81,406
2020	101,102	63,786	104,713	72,683	115,785	99,090
2025	107,900	67,040	112,516	79,788	129,284	120,616
2030	115,156	70,459	121,778	87,589	144,356	146,819

Figure 3-9
Flathead County Population Projections

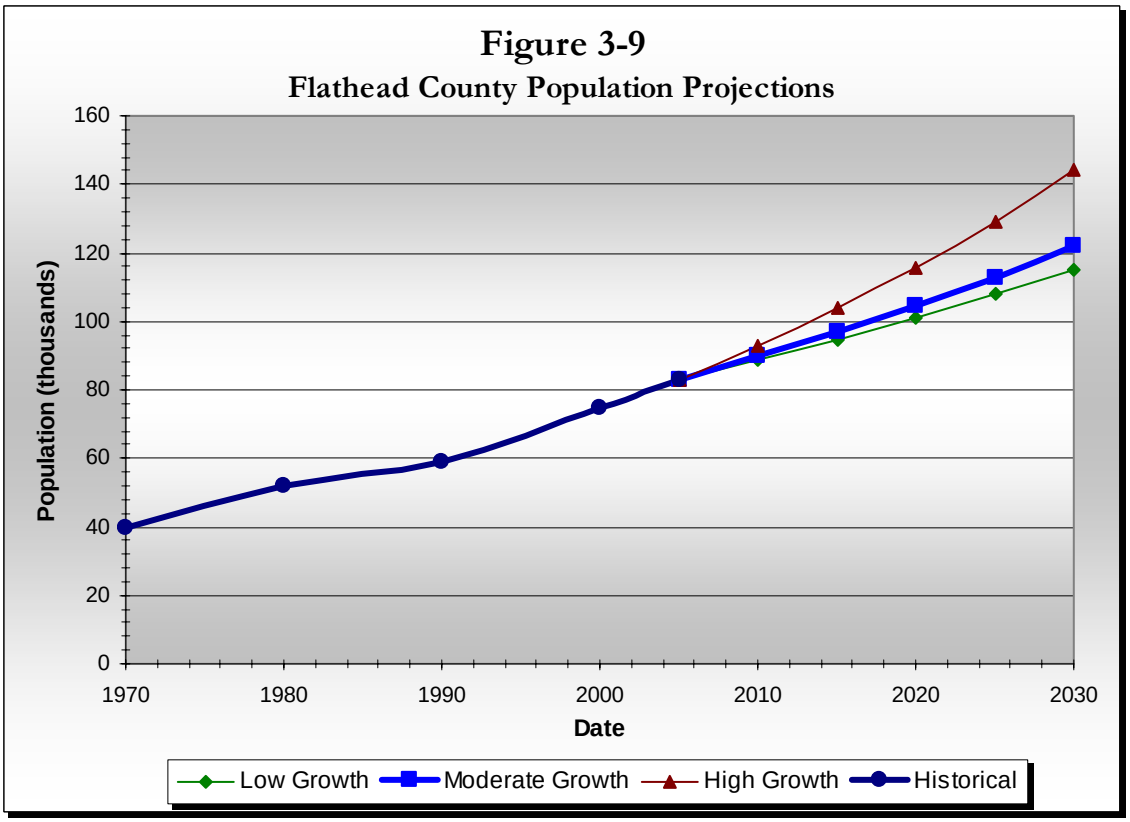
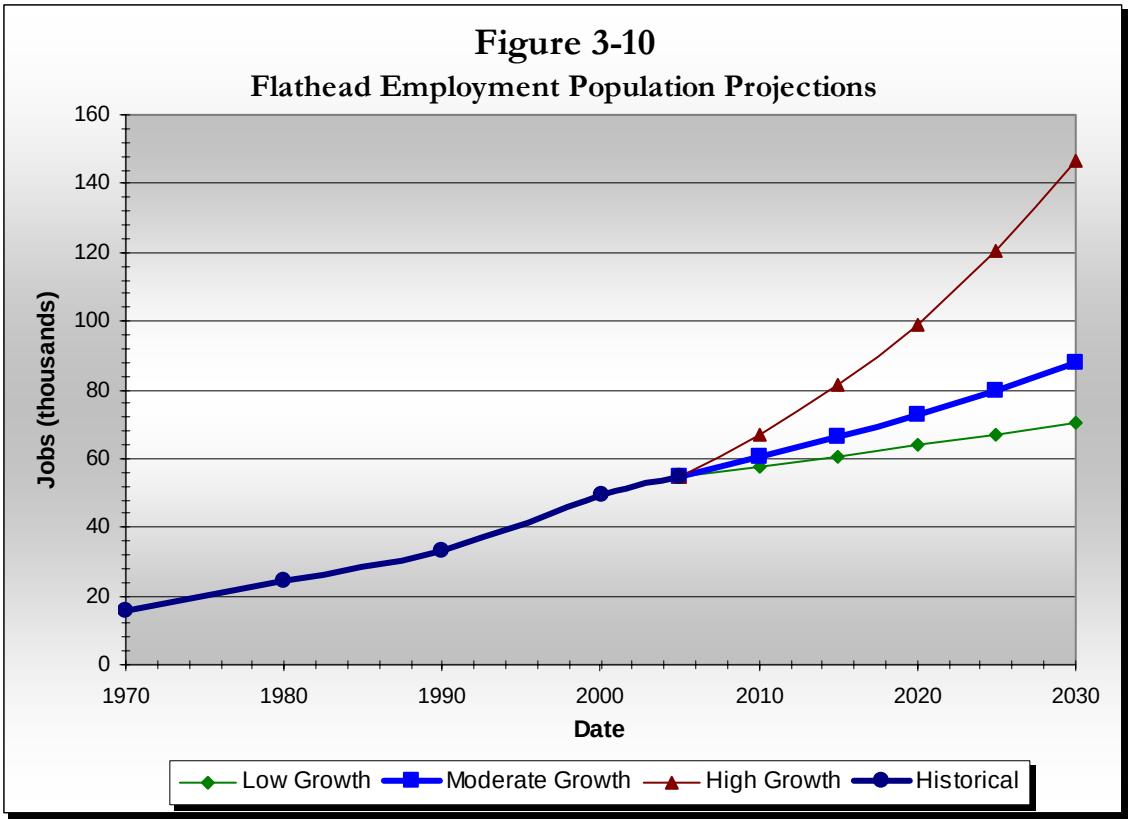


Figure 3-10
Flathead Employment Population Projections



The projections of population and employment presented above are for the entire area of Flathead County. The study area boundary for this Transportation Plan, however, is much smaller. Although County level projections are satisfactory to establish the overall growth rates and scenarios for future population and employment, this data must be reduced to accommodate the area within the planning boundary of the Transportation Plan. Forecasting for areas within study area boundary is underway in the City of Whitefish *Growth Policy Update* currently being developed. This document, which has the same study area boundary as the Transportation Plan project, forecasts a population growth out to the year 2017. This growth scenario amounted to a growth rate of 3.6% per year within the study area boundary. This particular document estimated that in 2005 there was a population of 11,500 people within the study area boundary. A projected population of 17,500 was made within the study area boundary utilizing what the current rate of development and absorption is for the planning area. Although this projection was only forecasted to the year 2017, it is reasonable to assume that growth will continue at this rate of 3.6% per year to the planning year 2030. This gives the study area a projected population forecast of 27,841

Table 3-8 presents population projections for the City of Whitefish and its planning jurisdictional area through the year 2030. Population projections for the years 2010, 2015, and 2020 represent proportional allocations of population over 5-year periods considering the total population growth over the 2005-2025 period under both low and high growth scenarios. The low scenario represents a growth rate of about 1% per year and the high scenario corresponds to a growth rate of about 3.6% per year. These growth rates were used to generate projections for the year 2030 under each scenario.

Future populations for the corridor study area were generated by first identifying the anticipated increases in dwelling (housing) units for each Census Block within the study area between the year 2000 and the year 2030. This data was conveniently obtained from inputs used for the urban travel demand model developed and maintained by the MDT with input provided by the Consultant. The total increase in dwelling units was multiplied by an average occupancy rate for dwelling units in the city to yield a total population increase for the corridor study area. This analysis identified an increase of nearly 630 housing units and a total population increase of about 1,290 residents by the year 2030. This total increase was then proportionally allocated over subsequent five-year periods starting between 2000 and 2030.

Please note the numbers shown in **Table 3-8** reflect the results of mathematical calculations to proportionately allocate population over time periods or reflect growth rates applied to known population totals. While the numbers suggest a high degree of accuracy, it is not possible to project future populations to the individual. It would be reasonable to round the projections to the nearest 50 or 100 for discussion purposes.

Table 3-8
Population Projections for the City of Whitefish and Whitefish Planning Jurisdictional Area

Year	City of Whitefish		Moderate Growth	
	Low	High	Low	High
2000 Census	5,032	5,032	--	--
2005(1)/(2)	7,092	7,092	11,500	11,500
2006(1)	7,723	7,723	--	--
2010(3)	7,429	8,481	12,141	14,462
2015(3)	7,766	9,871	12,783	17,424
2020(3)	8,102	11,260	13,424	20,386
2025(2)	8,439	12,649	14,065	23,348
2030(4)	8,813	14,617	14,791	27,841

Notes and Assumptions:

(1) 2005 and 2006 estimates of population for City of Whitefish from Annual Estimates of the Population for Incorporated Places in Montana, by County: April 1, 2000 to July 1, 2006. Source: Population Division, U.S. Census Bureau Release Date: June 28, 2007

(2) Projected 2005 population for the Whitefish Jurisdictional Area, and Year 2025 projections of population for the City of Whitefish and Whitefish Planning Jurisdictional Area from City's draft Growth Policy Update documents released in February 2007.

(3) Population increases under the "Low" and "High" growth scenarios for the City of Whitefish and its planning jurisdictional area were proportionally allocated over 5-year periods based on the total population growth projected over the 2005-2025 period under each scenario.

(4) Populations were projected for the year 2030 assuming a continuation of growth rates for the year 2005 through 2025 under the "Low" and "High" growth scenarios for the City of Whitefish and its planning jurisdictional area.

(5) The corridor study area population was projected by examining projected increase in dwelling (housing) units for the year 2030 in each Census Block and applying an average population per housing unit for 2000 Census Blocks in the corridor study area to yield a total population increase by the year 2030. The total increase in population was then proportionally allocated over five-year periods between 2000 and 2030.

3.3 ALLOCATION OF GROWTH WITHIN THE STUDY AREA

Montana Department of Transportation's modeling of future traveling patterns out to the year 2030 planning horizon required identification of future socioeconomic characteristics within each census tract and census block. County population and employment projections, coupled with the current Whitefish *Growth Policy Update*, were translated to predictions of increases in housing and employment within the Greater Whitefish area. This information was developed through a parallel project - the Montana Department of Transportation's "*Whitefish – Urban*" design project. For that particular project, a land use committee was set up to discuss future dwelling units, retail and non-retail employment assignments. This information was projected out to the year 2030, and the subsequent data was entered into the urban travel demand model. This data was reviewed by RPA and is in close compliance with the current Whitefish *Growth Policy Update* findings and Census Bureau forecasts. **Figure 3-11** and **Figure 3-12** show approximate locations of predicted residential growth over the planning horizon (i.e. year 2030). **Figure 3-13** and **Figure 3-14** show approximate locations of predicted "non-retail" employment growth over the planning horizon (i.e. year 2030). **Figure 3-15** and **Figure 3-16** show approximate locations of predicted "retail" employment growth over the planning horizon (i.e. year 2030).

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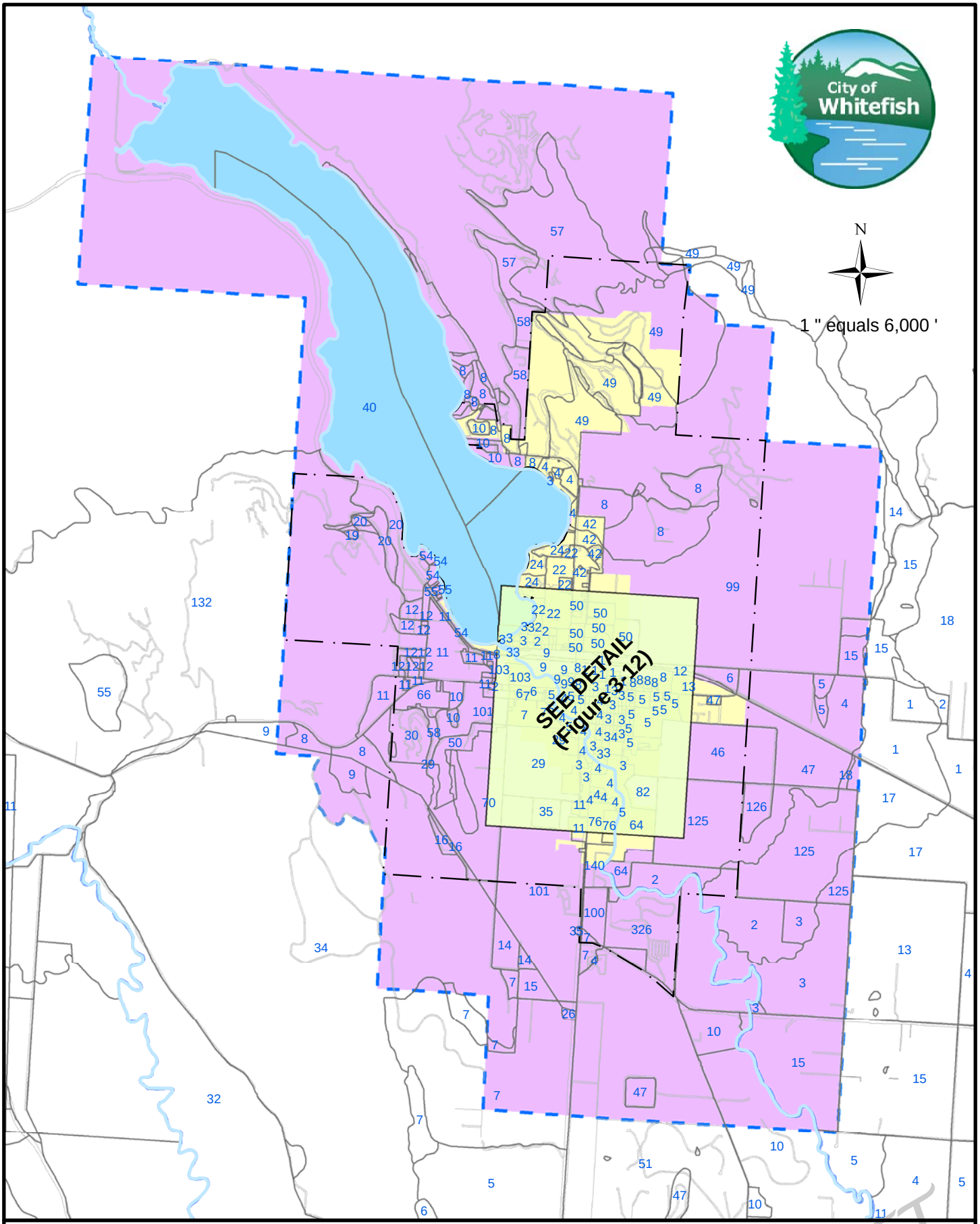
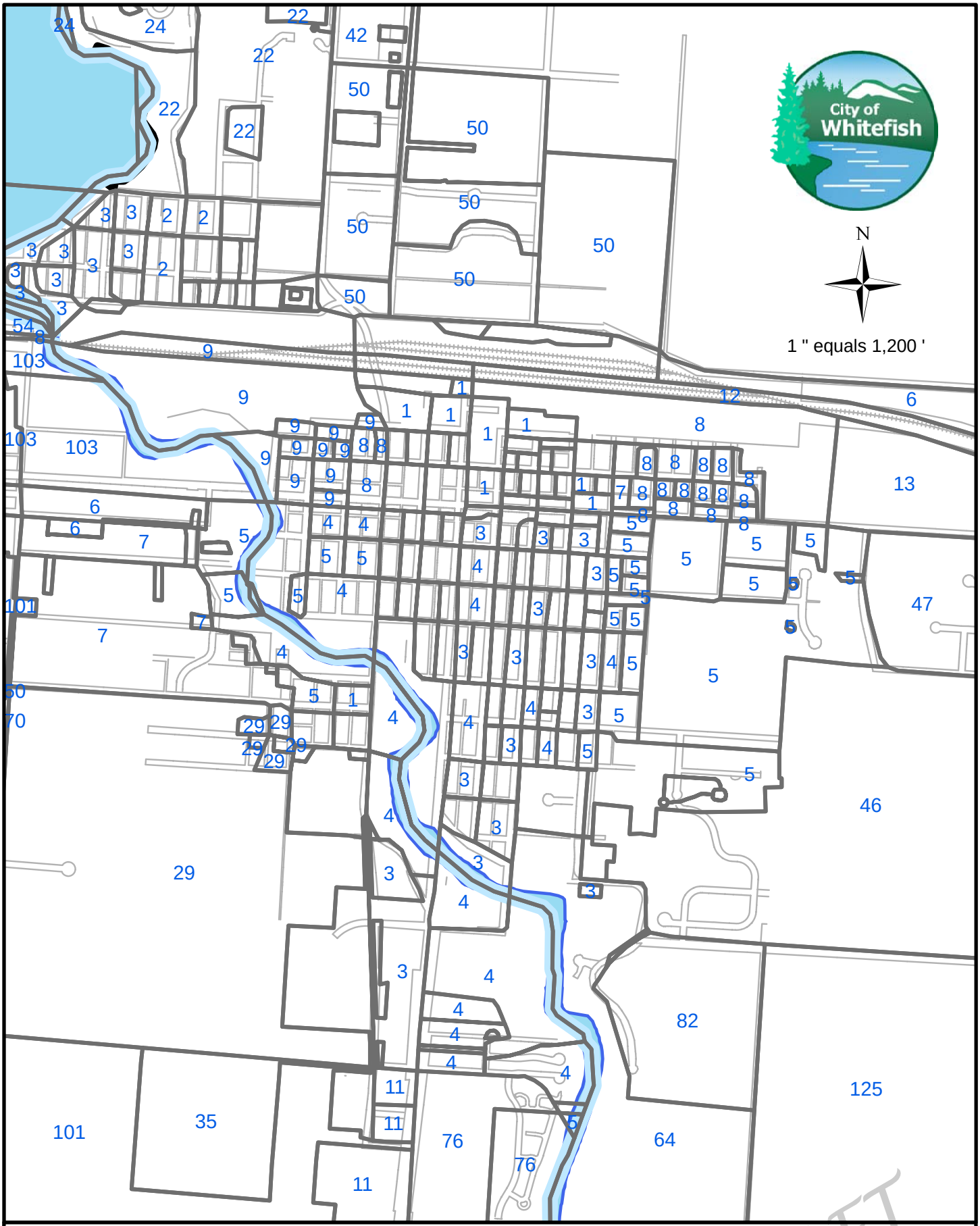


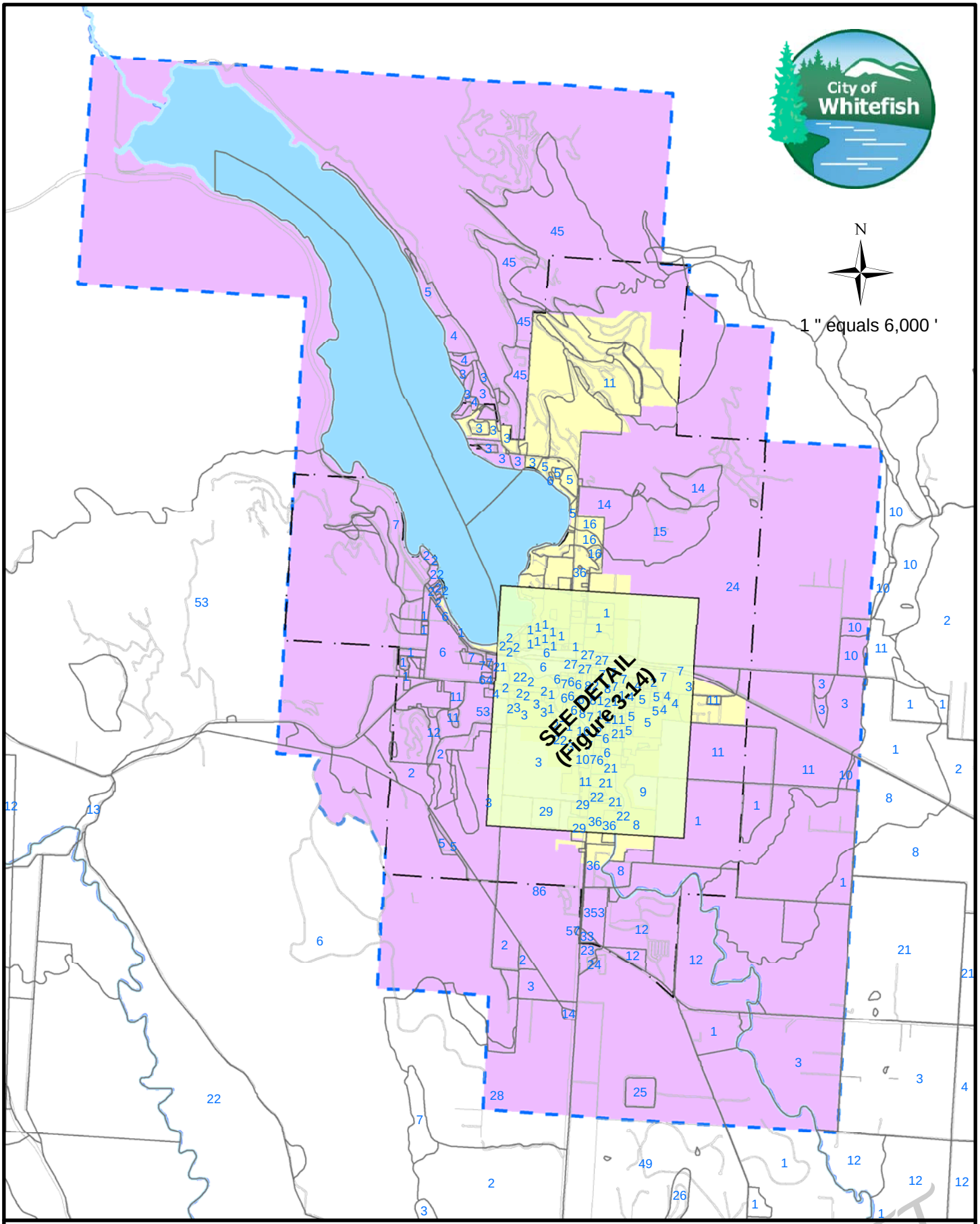
Whitefish Transportation Plan (2007)

Figure 3-11
Projected Dwelling Units (Year 2030)



Whitefish Transportation Plan (2007)

Figure 3-12
Projected Dwelling Units
(Year 2030)



Whitefish Transportation Plan (2007)

Figure 3-13
Projected Non-Retail Employment (Year 2030)

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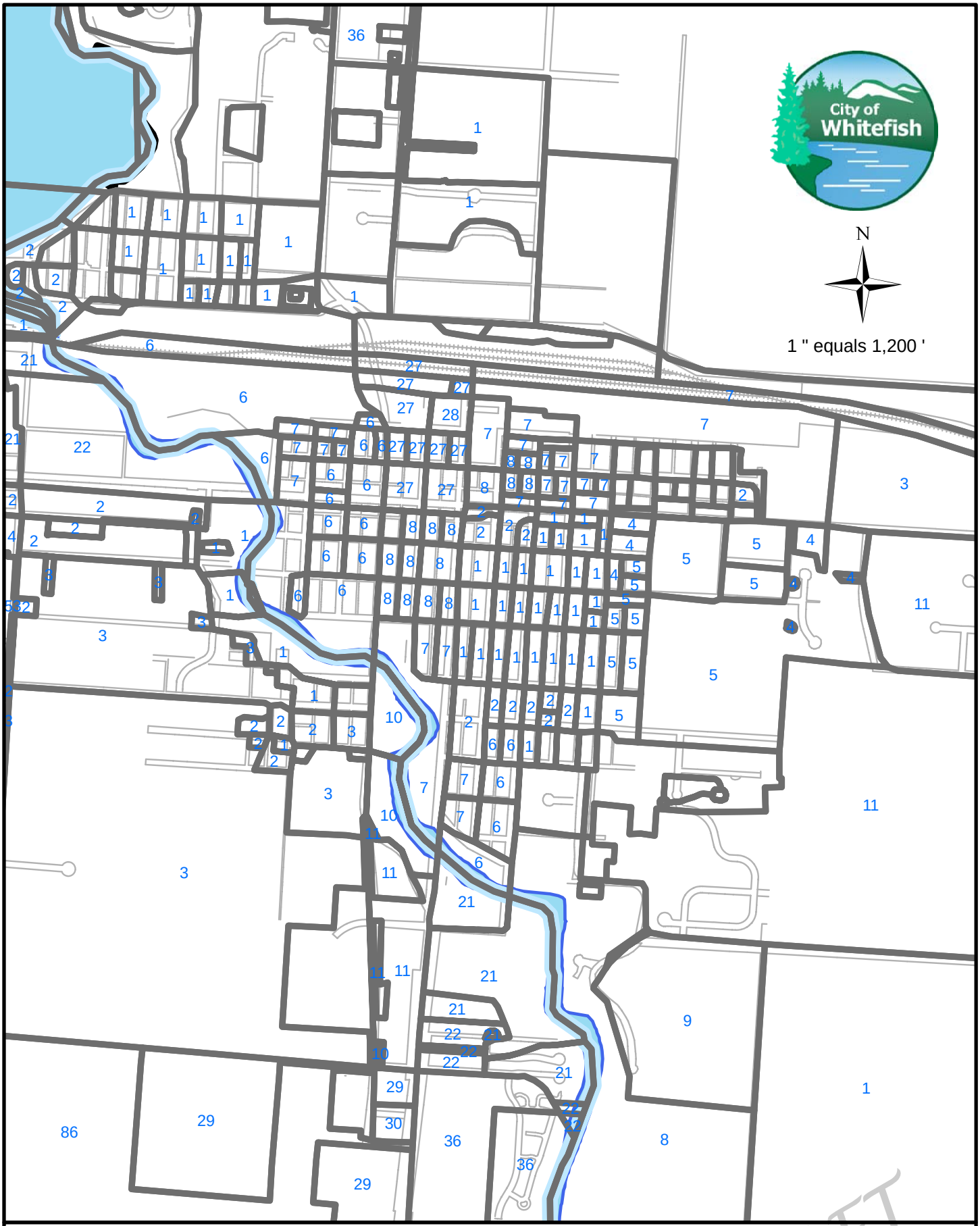

Whitefish Transportation Plan (2007)

Figure 3-14
Projected Non-Retail Employment (Year 2030)

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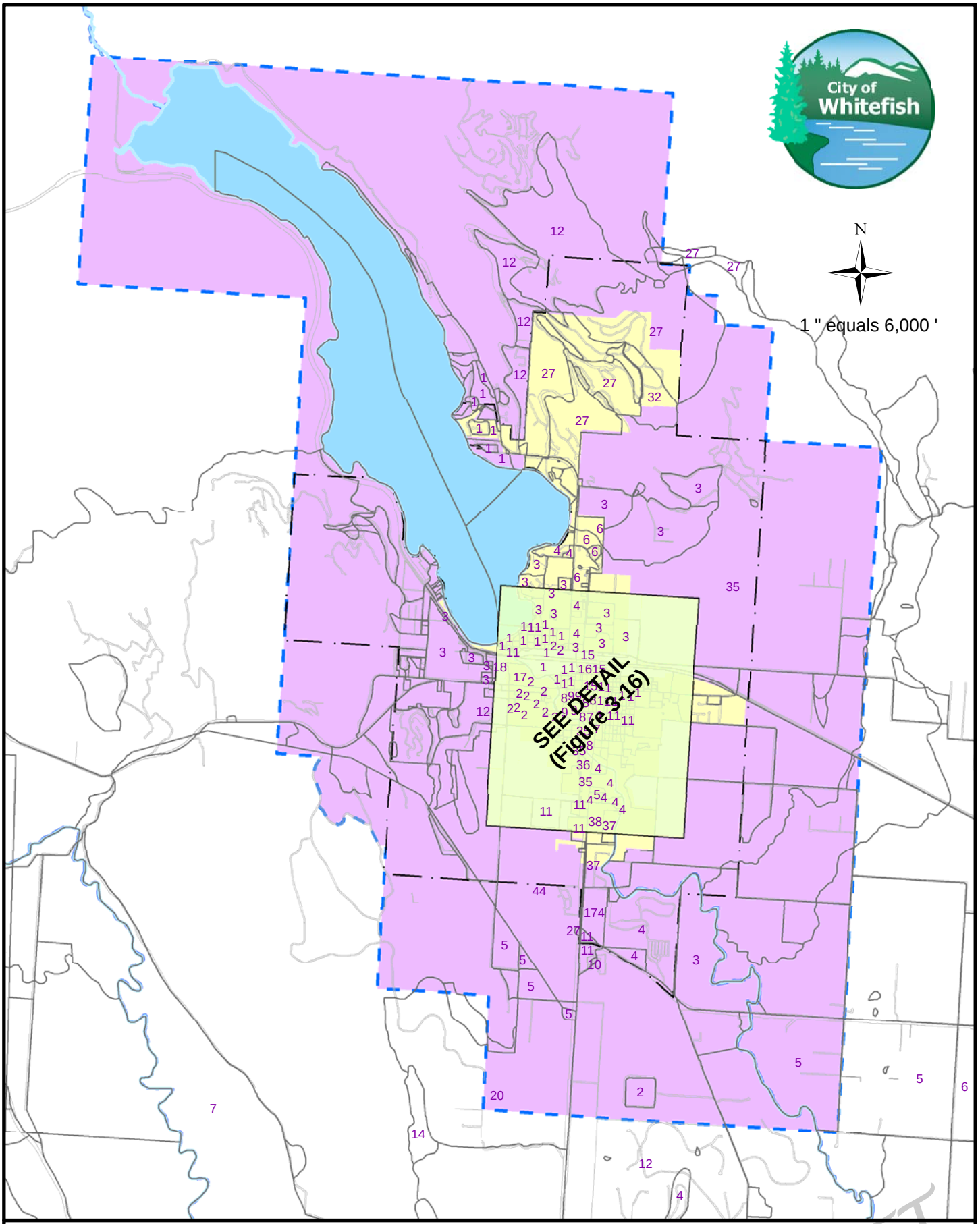
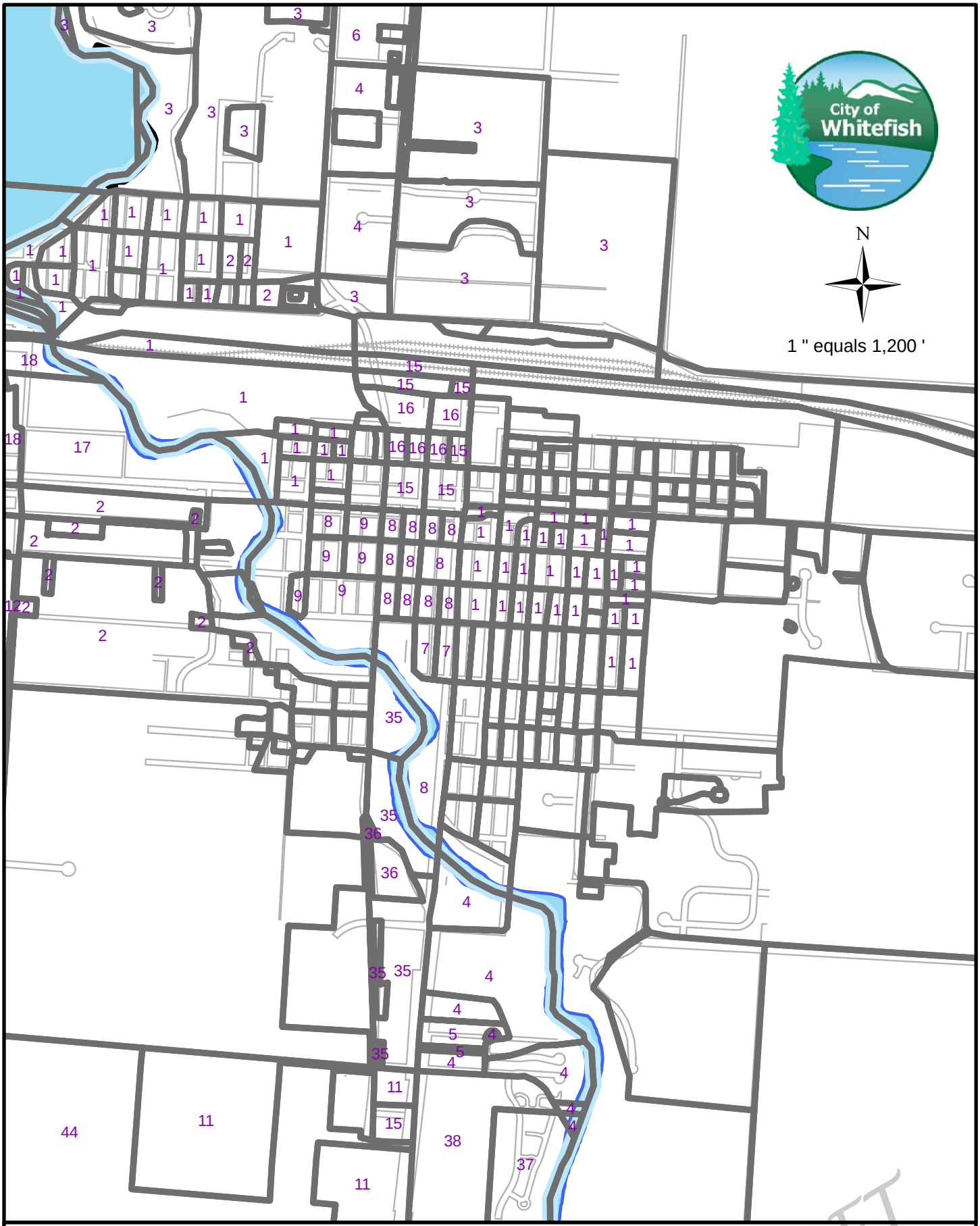


Whitefish Transportation Plan (2007)

Figure 3-15
Projected Retail Employment (Year 2030)



Whitefish Transportation Plan (2007)

Figure 3-16
Projected Retail Employment (Year 2030)

3.4 COMMITTED TRANSPORTATION IMPROVEMENTS

During the development of the traffic model, the existing road network is coded into the computer. This existing network is often called the "E Network." Once the "E Network" is developed, the next step is to consider and incorporate (as appropriate) all committed improvement projects. Generally, committed improvements listed herein are only considered if they are likely to be constructed within a five-year timeframe (i.e. year 2007 through the year 2012), and a funding source has been identified and is assigned to the specific project. Committed projects are only listed if the project will affect capacity and/or delay characteristics of a roadway facility and/or intersection. The addition of the committed improvements through year 2012 with the existing roadway network produces what is known as the "Existing plus Committed" network (referred to as the E+C Network). It is the E+C Network that is used for all future year analyses. In the Whitefish area, the following projects are "committed" projects for purposes of the travel demand modeling exercise:

CMSN-1 US Highway 93 (Whitefish-West)
This project includes the complete reconstruction of US Highway 93 west of Whitefish. The project is planned for construction beginning in the year 2011 and is estimated to cost $5.4 million dollars. The project is currently in the design phase.

CMSN-2 Wisconsin Avenue Bike/Pedestrian Path
This CTEP project includes the construction of a shared-use bike/pedestrian path along Wisconsin Avenue. The project will be built during the summer of 2008 and is estimated to cost $1.6 million dollars.

CMSN-3 Central Avenue (Railway to 3rd Street)
City of Whitefish project to enhance Central Avenue streetscape through mid-block crossings, decorative concrete, angled parking and elevated intersections. Some turn lane restrictions and curb bulb-outs will be incorporated into the project. The project is currently in the design phase.

CMSN-4 6th Street and Geddes Avenue
City of Whitefish reconstruction project of 6th Street and Geddes Avenue. Currently in design phase and being prepared for bid advertisement.

3.5 TRAFFIC MODEL DEVELOPMENT

All of the characteristics of the various areas of the greater Whitefish area combine to create the traffic patterns present in the community today. To build a model to represent this condition, the population information was collected from the 2000 census, and employment information was gathered from the Montana Department of Labor and Industry, second quarter of 2007, and was carefully scrutinized by local agency planners and MDT modeling staff.

The roadway network / centerline information was provided by the Flathead County GIS office. This information was substantially supplemented by input from staff at the City of Whitefish, Flathead County, and the Montana Department of Transportation who have substantial local knowledge and were able to increase the accuracy of the base model.

The GIS files, population census information, and employment information are readily available. The TransCAD software is designed to use this information as input data. TransCAD has been developed by the Caliper Corporation of Newton, Massachusetts, and version 4.0 was used as the transportation modeling software for this project. TransCAD performs a normal modeling process of generating, distributing and assigning traffic in order to generate traffic volumes. These traffic volumes are then compared to actual ground counts and adjustments are made to "calibrate", or ensure the accuracy of, the model. This is further explained below.

It should be noted that since these models are based on forecasted land uses and existing travel patterns, the resulting traffic volumes are not expected to be completely accurate but only to assist in the evaluation of projected future conditions.

Trip Generation - Trip Generation consists of applying nationally developed trip rates to land use quantities by the type of land use in the area. The trip generation step actually consists of two individual steps: trip production and trip attraction. Trip production and trip attraction helps to "explain" why the trip is made. Trip production is based on relating trips to various household characteristics. Trip attraction considers activities that might attract trip makers, such as offices, shopping centers, schools, hospitals and other households. The number of productions and attractions in the area is determined and is then used in the distribution phase.

Trip Distribution - Trip distribution is the process in which a trip from one area is connected with a trip from another area. These trips are referred to as trip exchanges.

Mode Split - Mode choice is the process by which the amount of travel will be made by each available mode of transportation. There are two major types: automobile and transit. The automobile mode is generally split into drive alone and shared ride modes. For the Whitefish travel demand model, there were no "mode split" assignments (i.e. all trips are assumed to be automobile mode).

Trip Assignment - Once the trip distribution element is completed, the trip assignment tags those trips to the Major Street Network (MSN). The variable that influence this are travel time, length, and capacity.

Due to the inherent characteristics of a traffic model, it is easy to add a road segment, or "link", where none exists now or widen an existing road and see what affect these changes will have on the transportation system. Additional housing and employment centers can be added to the system to model future conditions, and moved to different parts of the model area to see what affect different growth scenarios have on the transportation system. Thus the land use changes anticipated between now and 2030 can be added to the transportation system, and the needed additions to the transportation system can then be identified.

Additionally, different scenarios for how the Greater Whitefish area may grow between now and 2030 can be examined to determine the need for additional infrastructure depending upon which one most accurately represents actual growth.

To develop a transportation model, the modeling area must be established. The modeling area is, by necessity, much larger than the Study Area. Traffic generated from outlying communities or areas contributes to the traffic load within the Study Area, and is therefore important to accuracy of the model. Additionally, it is desirable to have a large model area for use in future projects.

The future year model was developed specifically for the year 2030 planning horizon. The 2030 model is used in this document to evaluate future traffic volumes, since 2030 is the horizon year for this document. The information contained in **Sections 3.1**, **3.2** and **3.3** was used to determine the additions and changes to the traffic volumes in 2030.

The modeling area was subdivided by using census tracts and census blocks, as previously described in this chapter. Census blocks are typically small in the downtown and existing neighborhood areas, and grow geographically larger in the less densely developed areas. The census blocks & census tracts were used to divide the population and employment growth anticipated to occur between now and 2030.

3.6 TRAFFIC VOLUME PROJECTIONS

The traffic model was used to produce traffic forecasts for the planning horizon year of 2030. The model also presented values for v/c (volume/capacity) ratios. The v/c ratio gives a numeric value for the level of actual volume on the roadway compared to the capacity of the roadway. A v/c level above 1.0, for example, means that the volume on the roadway is past the capacity level that the roadway is intended to handle.

Traffic model results for the calibration year on 2003 are presented in **Figure 3-17** and **Figure 3-18** with the v/c levels for 2003 being shown graphically in **Figure 3-19** and **Figure 3-20**. Year 2030 traffic volume projections are presented in **Figure 3-21** and **Figure 3-22** with 2030 projected v/c levels presented in **Figure 3-23** and **Figure 3-24**. These projections indicate that the traffic volumes on some of the major corridors will increase significantly over the next 23 years. Projected volumes indicate that numerous roadways will have a v/c ratio greater than one by the year 2030.

It is important to recognize that the volumes and v/c ratios shown in **Figures 3-21** thru **3-24** are based on the "Existing plus Committed" roadway network. In other words, these are the volumes and v/c ratios if no changes to the transportation system are made.

Also note that the data presented in **Figure 3-17** thru **Figure 3-24** is also shown in tabular format in **Table 4-3** in **chapter 4** of this Transportation Plan.

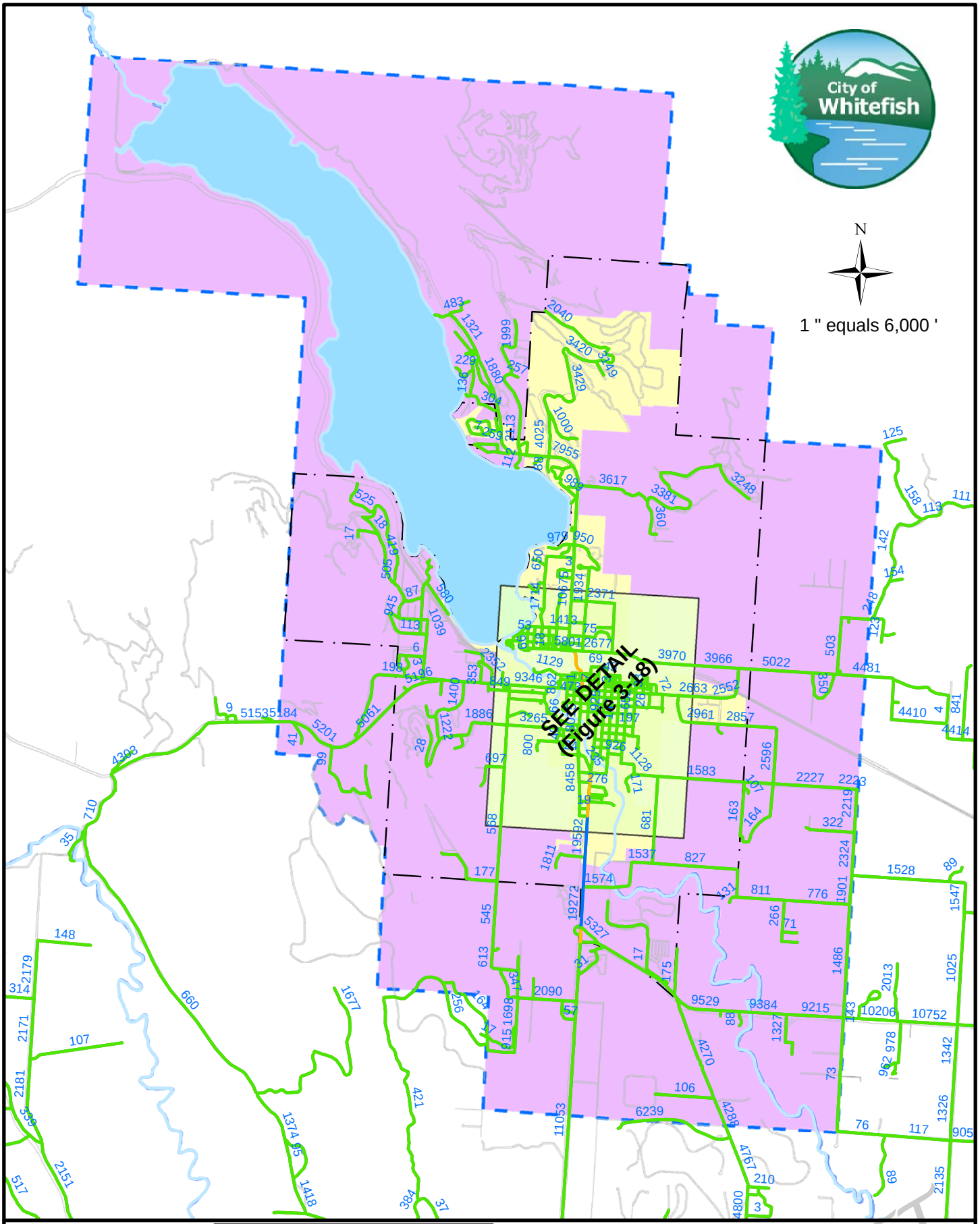
Table 3-9

Roadways At or Above Capacity Level by 2030

Roadway		Volume	V/C Ratio
Murdock Ln.	E. Lakeshore Dr. to Ridgecrest Dr.	9,715	2.43
Wisconsin Ave.	Colorado Ave. to Reservoir Rd.	23,938	2.18
Iron Horse Dr.	Ridgecrest Dr. to Yampah Ln.	8,244	2.06
U.S. Highway 93	Lion Mountain Rd. to Fairway Dr.	21,344	1.94
U.S. Highway 93	Fairway Dr. to Karrow Ave.	20,448	1.86
Viaduct	Railway St. to Edgwood Pl.	27,473	1.83
E. Lakeshore Dr.	Reservoir Dr. to Huston Dr.	19,194	1.74
Iron Horse Dr.	Yampah Ln. to Lookout Ln.	6,802	1.70
2nd St.	Good Ave. to Lupfer Ave	16,927	1.54
Railway St.	Baker Ave. to Central Ave.	6,154	1.54
Stage Line Rd.	MT. Highway 40 to the end	7,669	1.53
Parkhill Dr.	U.S. Highway 93 to W. 3rd St.	7,668	1.53
W. 3rd St.	Parkhill Dr. to Karrow Ave.	7,652	1.53
Baker Ave.	W. 8th St. to W. 13th St.	15,827	1.44
MT. Highway 40	U.S. Highway 93 to Kalner Ln.	15,534	1.41
W. 6th St.	Scott Ave. to Baker Ave.	5,636	1.41
Edgewood Dr.	E. 2nd St. to E. Texas Dr.	13,975	1.40
5th St.	Baker Ave. to Central Ave.	5,393	1.35
Spokane Ave.	13th St. to 9th St.	14,729	1.34
Texas Ave.	Edgewood Pl. to Waverly Pl.	6,710	1.34
Blanchard Lake Rd.	U.S. Highway 93 to Meadows Rd.	6,671	1.33
Baker Ave.	1st St. to Railway St.	19,827	1.32
Armory Rd.	Southern portion of Armory Rd. to Voerman Rd.	6,604	1.32
E. 2nd St.	Larch Ave. to Armory Rd.	13,128	1.31
Reservoir Rd.	Wisconsin Ave. to Rick Oshay Rd.	6,550	1.31
Spokane Ave.	9th St. to 8th St.	14,160	1.29
E. 2nd St.	Armory Rd. to Edgewood Dr.	12,887	1.29
Spokane Ave.	8th St. to 6th St.	14,066	1.28
Edgewood Pl.	E. Texas Dr. to Texas Ave.	12,789	1.28
Spokane Ave.	1st St. to 2nd St.	5,134	1.28
Texas Ave.	Waverly Pl. to Cedar St.	6,362	1.27
W. 5th St.	Geddes Ave. to Scott Ave.	5,094	1.27
U.S. Highway 93	JP Road to MT. Highway 40	36,610	1.26
Baker Ave.	W. 7th St. to W. 8th St.	13,851	1.26
Greenwood Dr.	Entrance to Greenwood Mobile Home Park to the end	5,002	1.25

Park Ave.	10th St. to Voerman Rd.	4,976	1.24
U.S. Highway 93	19th St. to JP Road	35,650	1.23
Reservoir Rd.	Rick Oshay Rd. to Northwoods Dr.	6,150	1.23
Kalner Ln.	MT. Highway 40 to the end	6,129	1.23
Central Ave.	2nd St. to 1st St.	4,912	1.23
3rd St.	Baker Ave. to Central Ave.	4,891	1.22
4th St.	Baker Ave. to Spokane Ave.	4,888	1.22
1st St.	Baker Ave. to Spokane Ave.	4,879	1.22
Lion Mountain Rd.	State Park Rd. to U.S. Highway 93	12,113	1.21
Wisconsin Ave.	Denver St. to Colorado Ave.	10,675	1.21
Park Knoll Ln.	U.S. Highway 93 to the end	6,034	1.21
MT. Highway 40	West of River Bluff to the west of Dillon Rd.	13,176	1.20
Fairway Dr.	Tides Way to Karrow Ave.	4,740	1.19
Voerman Rd.	Monegan Rd. to Shady River Ln.	4,739	1.18
W. 2nd St.	Karrow Ave. to Good Ave.	12,883	1.17
1st St.	Lupfer Ave. to Baker Ave.	4,696	1.17
3rd St.	Central Ave. to Spokane Ave.	4,657	1.16
5th St.	Central Ave. to Spokane Ave.	4,598	1.15
W. 7th St.	Karrow Ave. to Scott Ave.	11,373	1.14
Miles Ave.	2nd St. to 1st St.	4,551	1.14
Baker Ave.	W. 13th St. to W. 15th St.	12,482	1.13
State Park Rd.	Haugen Heights R. to Lion Mountain Rd.	11,253	1.13
Blanchard Lake Rd.	Meadows Rd. to the south of Blanchard Lake Dr.	5,670	1.13
Good Ave.	W. 2nd St. to W. 3rd St.	4,511	1.13
Baker Ave.	2nd St. to 1st St.	16,657	1.11
Wisconsin Ave.	Woodland Pl. to the north of Woodside Ln.	12,195	1.11
W. 7th St.	Scott Ave. to Baker Ave.	11,101	1.11
E. Lakeshore Dr.	Mason Park to Huston Pt.	5,440	1.09
Baker Ave.	W. 6th St. to W. 7th St.	11,802	1.07
Dillon Rd.	Braig Rd. to Monegan Rd.	5,342	1.07
Dillon Rd.	Monegan Rd. to Braig Rd.	5,342	1.07
Colorado Ave.	Denver St. to Crestwood Ct.	10,615	1.06
Edgewood Pl.	Iowa Ave. east	10,571	1.06
JP Road	U.S. Highway 93 to the east of Whitefish River	10,557	1.06
Fairway Dr.	U.S. Highway 93 to Green Pl.	4,230	1.06
Columbia Ave.	10th St. to 7th St.	10,424	1.04
Edgewood Dr.	Haskill Basin Rd. to E. 2nd St.	10,423	1.04
Karrow Ave.	W. 3rd Ave. to W. 4th Ave.	10,334	1.03

Lookout Ln.	Iron Horse Dr. to the urban boundary	4,139	1.03
6th St.	Spokane Ave. to Central Ave.	4,133	1.03
Central Ave.	6th Ave. to 2nd St.	4,133	1.03
Kalispell Ave.	8th St. to 7th St.	4,128	1.03
Baker Ave.	W. 15th St. to W. 18th St.	11,250	1.02
Geddes Ave.	W. 4th St. to W. 5th St.	5,110	1.02
Haugen Heights	Patio N. Ln. to State Park Rd.	5,089	1.02
2nd St.	Spokane Ave. to Baker Ave.	12,192	1.01
Edgewood Pl.	Colorado Ave. East	10,137	1.01
E. 2nd St.	Pine Ave. to Mill Ave.	9,978	1.00
Fairway Dr.	Fairview Dr. to Tides Way	4,017	1.00
Barkley Ln.	Wisconsin Ave. to Harbor Ct.	3,987	1.00



Whitefish Transportation Plan (2007)

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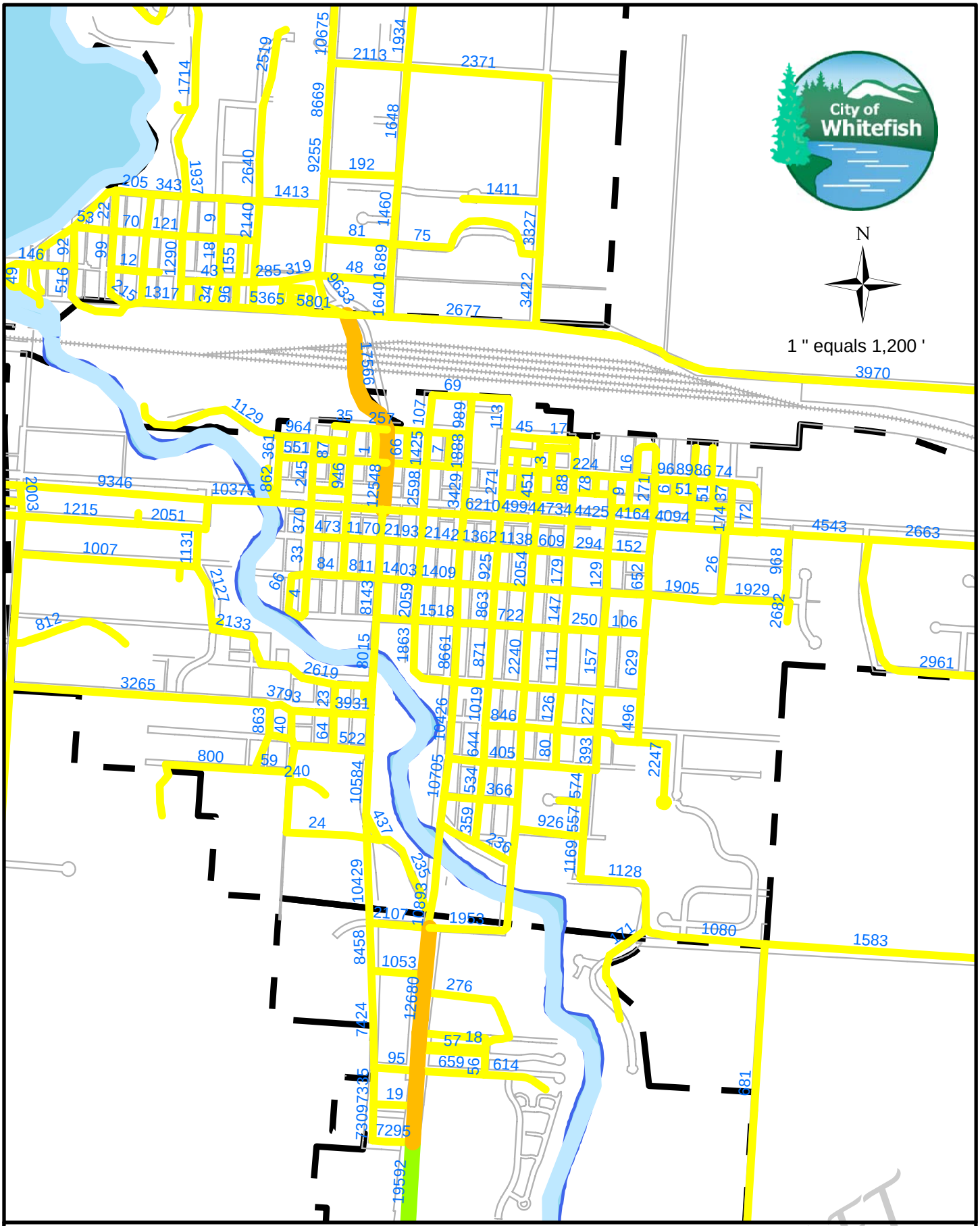
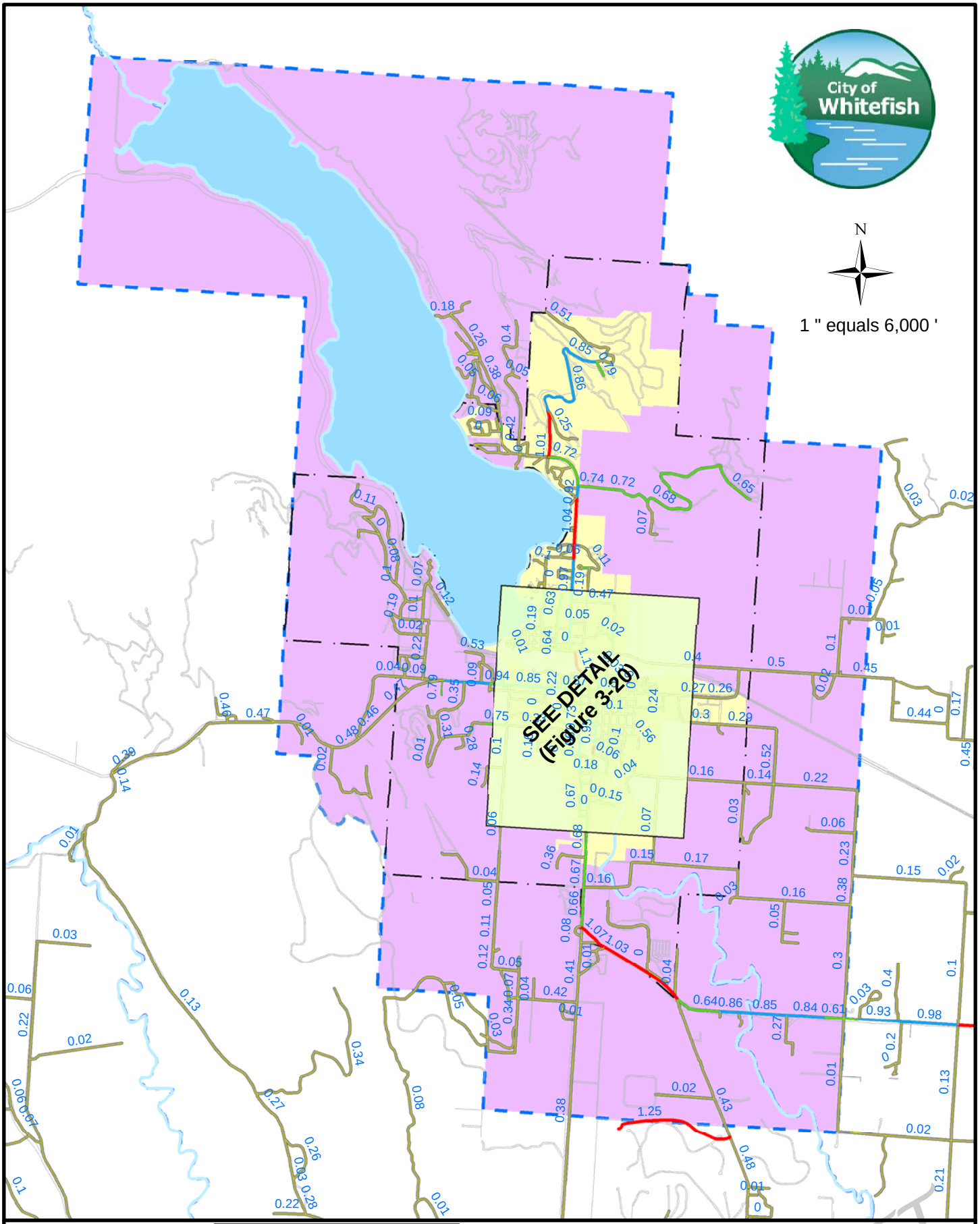
Figure 3-17
2003 Traffic Volumes



Whitefish Transportation Plan (2007)

Figure 3-18
2003 Traffic Volumes



Whitefish Transportation Plan (2007)

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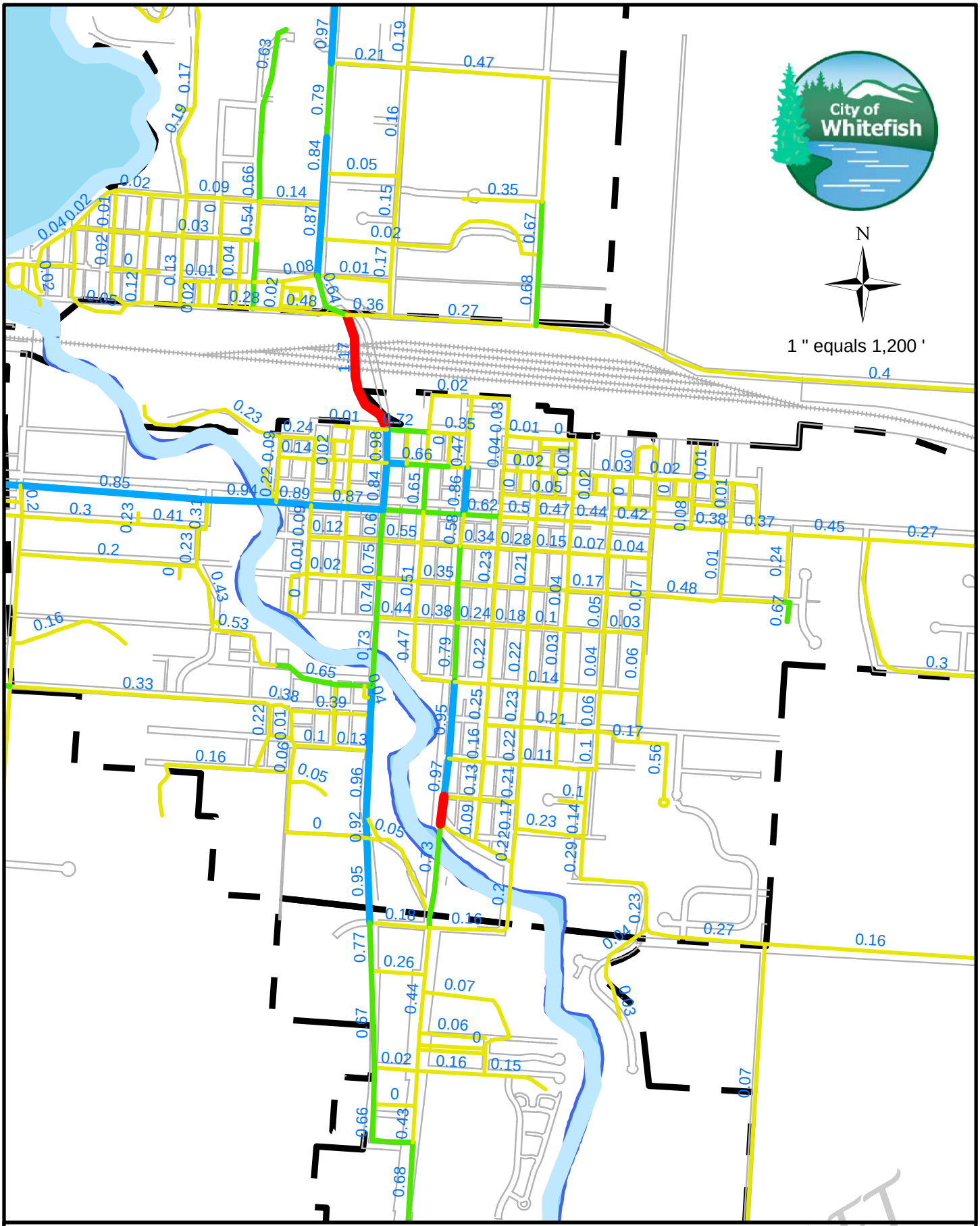
Figure 3-19
2003 V/C Ratios



Whitefish Transportation Plan (2007)

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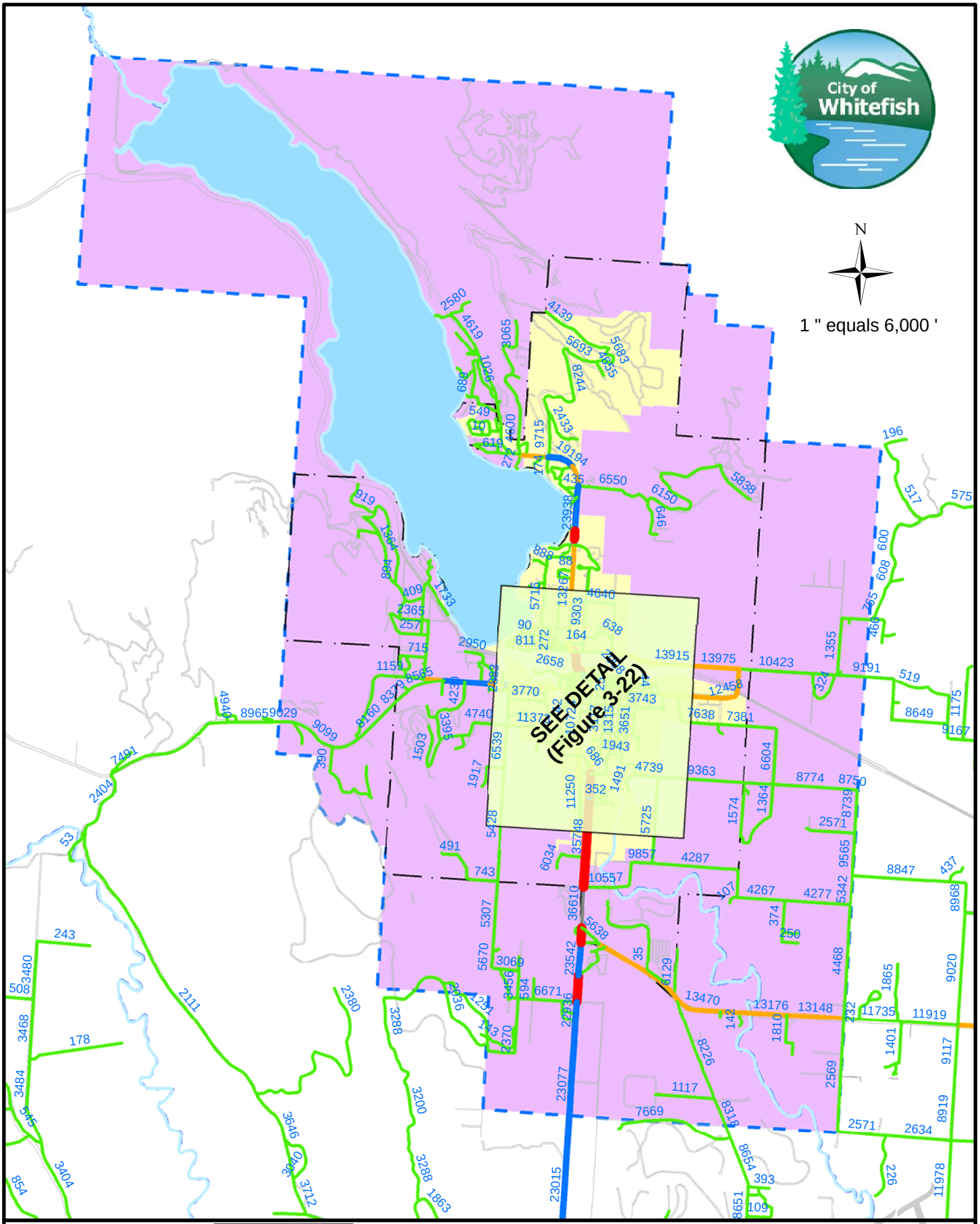
Figure 3-20
2003 V/C Ratios



Whitefish Transportation Plan (2007)

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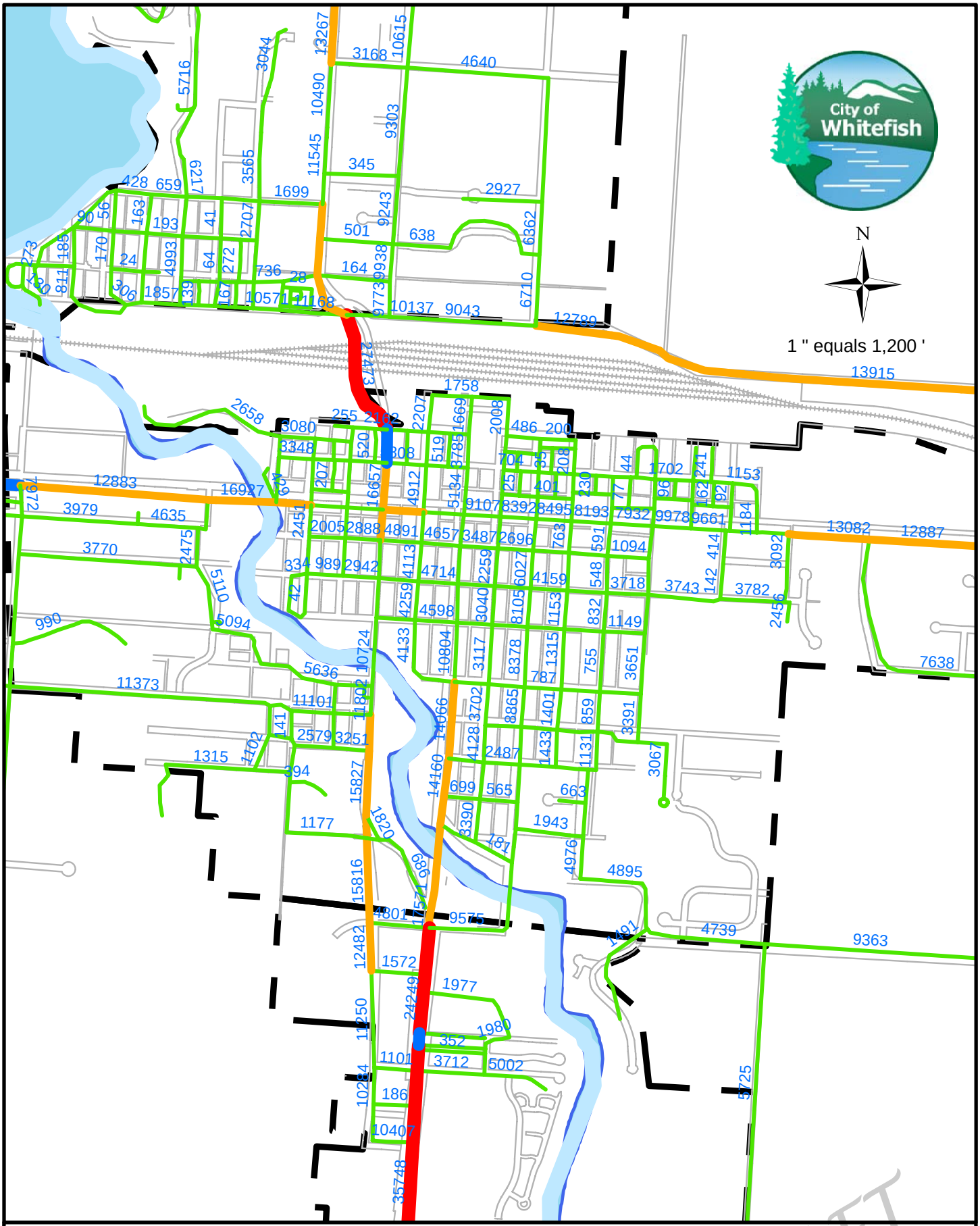
Figure 3-21
2030 Traffic Volumes



Whitefish Transportation Plan (2007)

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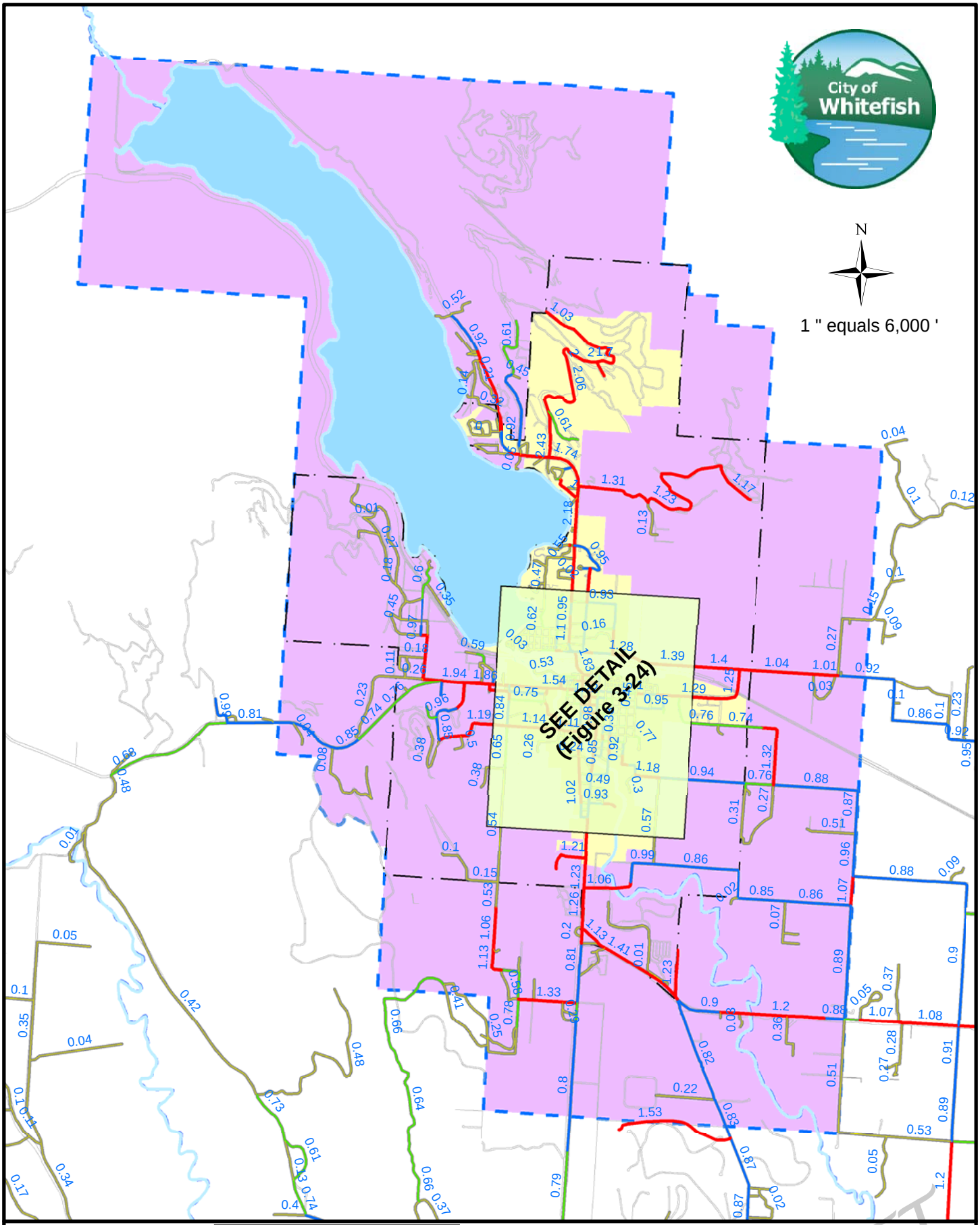
Figure 3-22
2030 Traffic Volumes



Whitefish Transportation Plan (2007)

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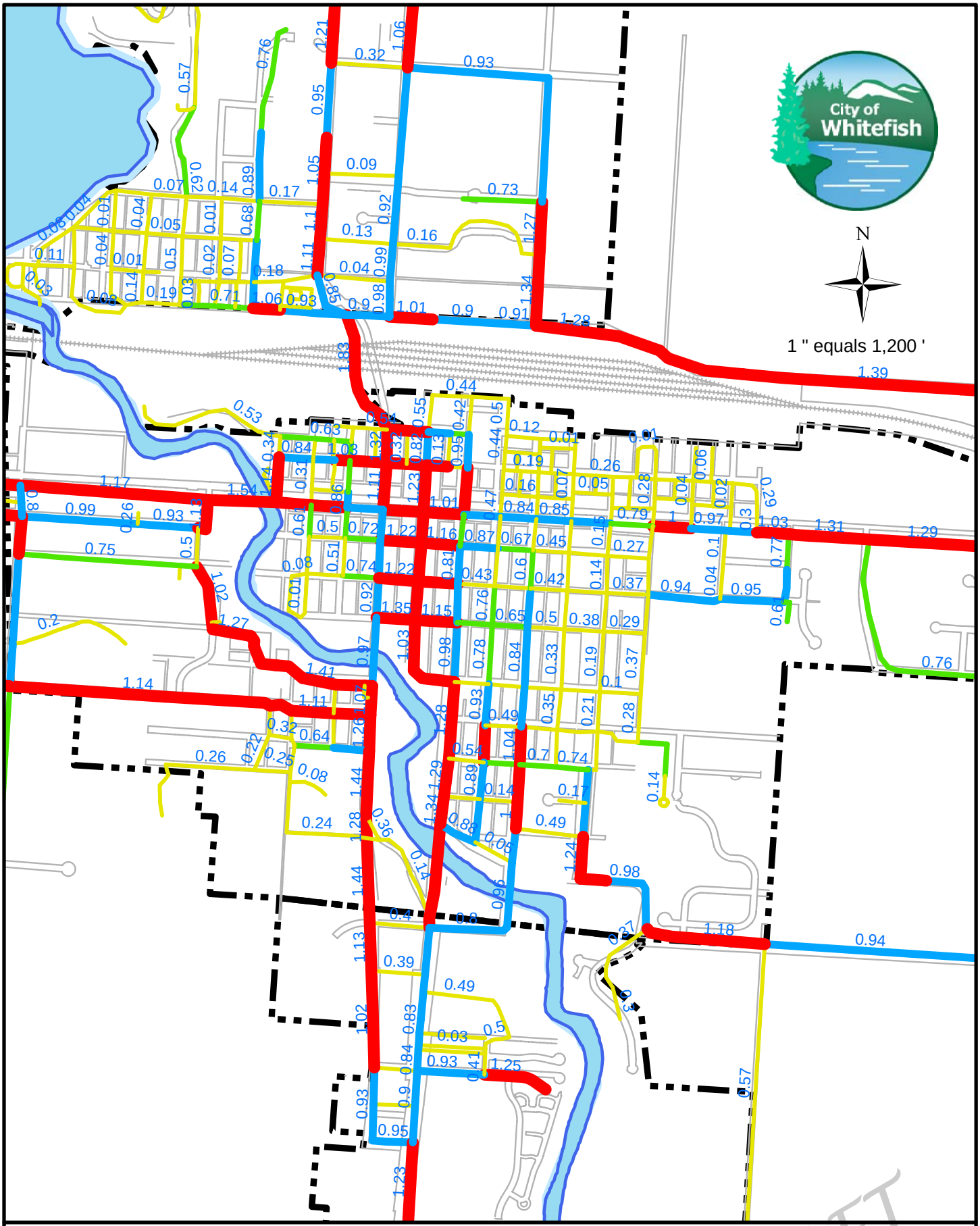
Figure 3-23
2030 V/C Ratios



Whitefish Transportation Plan (2007)

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Figure 3-24
2030 V/C Ratios

3.7 NETWORK ALTERNATIVES TEST RUN ANALYSIS

Using the traffic model provided by MDT, it is possible to produce traffic assignments that predict the effects of major modifications and additions to the street network. Alternatives such as the addition of new arterial links, street closures, or the extension of existing routes were identified and discussed. Major improvements can then be grouped together and superimposed on the existing network. The impacts of implementing the alternative actions can then be determined for each test run. These tests help determine possible benefits and drawbacks of a variety of potential changes to the major street network.

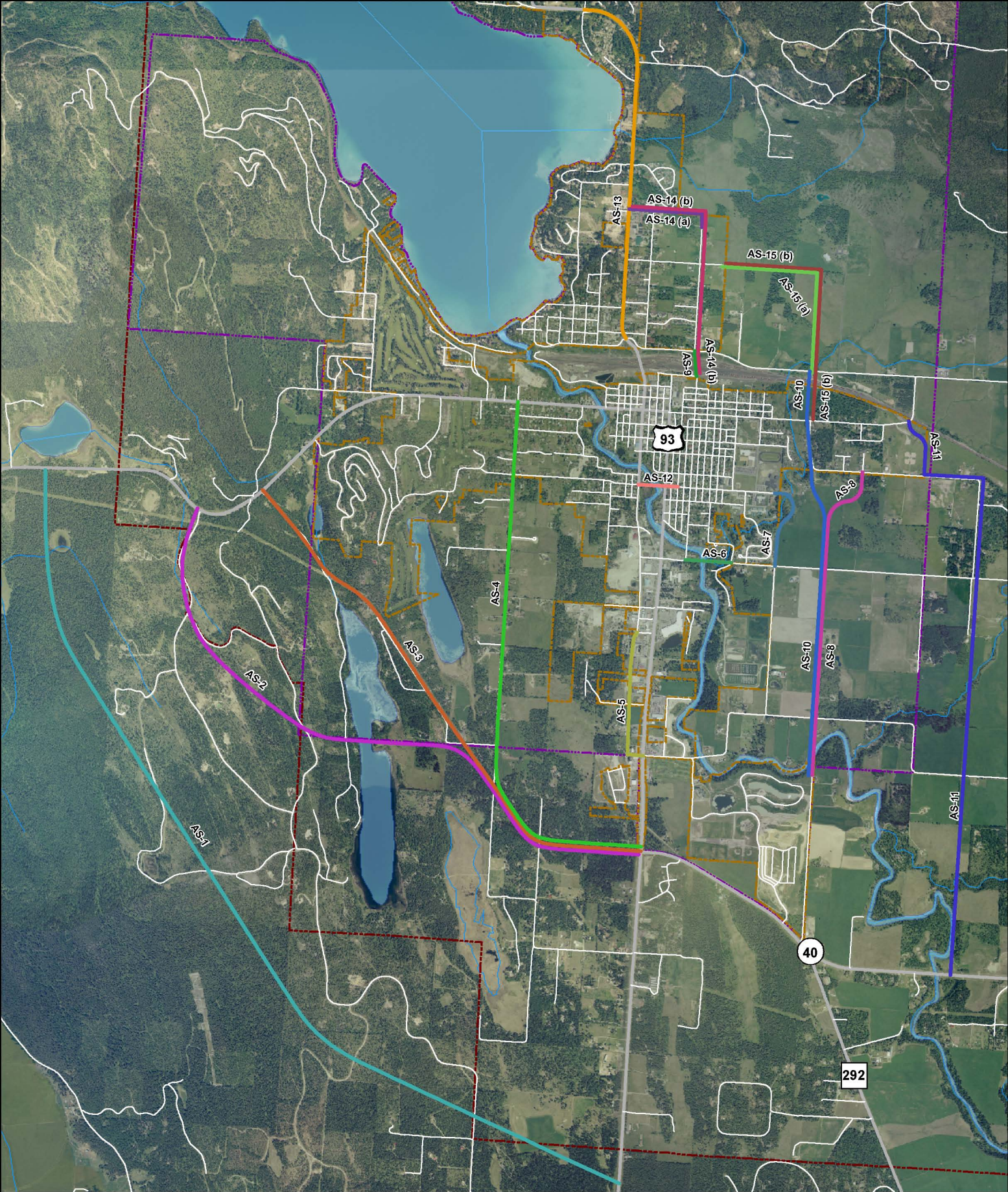
Seventeen (17) "alternative scenarios" have been test modeled. This section of the Plan contains the descriptions of the proposed modifications included in each model run, along with a brief description of the resulting traffic volume changes. All results reflect year 2030 projected traffic volumes from the *TransCAD* traffic model. **Table 3-10** gives a brief description and location for the alternative scenarios. **Figure 3-25** graphically shows the location of each alternative scenario.

Again, it must be noted that since these models are based on forecasted land uses and existing travel patterns, the resulting traffic volumes are not expected to be completely accurate but only to assist in the evaluation of projected future conditions.

Table 3-10

Whitefish Alternative Scenarios

I.D.	Name	Description
AS-1	Western Route Alternative A	Begins at an intersection with US 93 approximately 1.7 miles (2.73 kilometers) south of the US 93 intersection with MT 40. Alternative A travels in a northwesterly direction and follows an existing dirt road for the first 1.7 miles (2.73 kilometers). The alternative then proceeds north through natural drainage swales to connect back with US 93.
AS-2	Western Route Alternative B	Begins at the intersection of MT 40 and US 93. The alternative would then proceed west to meet with Blanchard Lake where a bridge would be required to cross the lake. After the bridge, the alternative would head northwest to connect back with US 93.
AS-3	Western Route Alternative C	Begins at the intersection of MT 40 and US 93. The alternative would then follow the same alignment as Alternative B for the first 1.5 miles (2.41 kilometers). At this point the alternative would then follow the eastern side of Blanchard Lake along existing power lines to a point where it would meet back up with US 93.
AS-4	Western Route Alternative D	Begins at the intersection of MT 40 and US 93 and would follow the same alignment as Alternative B until it intersects with Karrow Avenue (approximately 1.4 miles). The alternative would then proceed north along Karrow Avenue to intersect with US 93.
AS-5	Baker Avenue Extension	This alternative would extend Baker south from 19th Street to a connection with J.P. Road. The approximate length of this extension is 0.68 miles.
AS-6	13th Street Bridge	This alternative would consist of adding a bridge across the Whitefish River to connect 13th Street and Voerman Road. The extension would be approximately 0.23 miles long.
AS-7	7th Street Extension	This alternative starts at the eastern end of 7th street. The route would head east across Cow Creek then would head south to connect with Voerman Road at the intersection with Monegan Road.
AS-8	Kalner Lane Extension	Under this scenario, Kalner Lane would be extended to the north to cross Voerman Road. The road would then continue to connect with Armory Road at the intersection with Peregrine Lane. A bridge would be needed to cross the Whitefish River just south of Monegan Road.
AS-9	Texas/Columbia Railroad Crossing	This alternative consists of adding an elevated railroad crossing to connect Texas Avenue with Columbia Avenue.
AS-10	Cow Creek Railroad Crossing	This alternative consists of extending Kalner Lane north to intersect with Armory Road. The alternative would then travel along the existing Armory road to the intersection with 2nd Street. An elevated railroad crossing would then be added at this location to connect with East Edgewood Drive.
AS-11	Armory Road Extension	This scenario calls for an extension of Armory Road to be built starting at the intersection with Voerman Road and heading south along Reimer Road across Monegan Road to intersect with MT Highway 40. This alternative also consists of a northern connection from Armory Road to East 2nd Street to access the railroad crossing.
AS-12	7th Street Bridge	This alternative would consist of adding a bridge across the Whitefish River to connect 7th street at the intersections of Baker Avenue and Kalispell Avenue.
AS-13	Wisconsin Avenue Improvements	Under this scenario, Wisconsin Avenue would be upgraded to a 3-lane urban design standard. This would create a center left-turn bay.
AS-14 (a)	NE Extension to Texas Avenue (a)	This alternative creates an extension from Wisconsin Avenue to Texas Avenue.
AS-14 (b)	NE Extension to Texas Avenue (b)	This alternative uses the same extension as **AS-14 (a)** but adds the railroad crossing as described in **AS-9**.
AS-15 (a)	NE Extension to Cow Creek (a)	This alternative would be an extension of Denver Avenue to the east and then south to intersect with East Edgewood Drive.
AS-15 (b)	NE Extension to Cow Creek (b)	This alternative has the same extension to Denver Avenue as **AS-15 (a)** but adds the railroad crossing as described in **AS-10**.



Legend

- Off System Route
- On System Route
- AS-1 Alternative Scenario
- Study Boundary
- City Boundary
- Urban Boundary

N

Whitefish Alternative Scenarios

Figure 3-25

0 0.25 0.5 1 1.5 2 Miles

○ Alternative Scenario 1 (Western Route Alternative A)

AS-1 consists of a western route that begins at an intersection with Highway 93 approximately 1.7 miles south of the intersection of Highway 93 and MT Highway 40. The route would travel in a northwesterly direction along an existing dirt road and through natural drainage swales to connect back with Highway 93. Adding this route serves traffic on Highway 93 that does not need to pass through Whitefish for its intended destination. This route creates a notable drop in traffic along Highway 93 in the Whitefish area and also decreases traffic volumes around Karrow Ave.

Table 3-11

Alternative Scenario 1 (Western Route Alternative A)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
HWY 93 (north of AS-1)	23,100	20,200	-2,900	-12.6%
Blanchard Lake Rd (west of HWY 93)	5,900	4,600	-1,300	-22.0%
13th Street West (west of HWY 93)	4,800	4,000	-800	-16.7%
Spokane Ave just (south of 2nd St)	8,100	7,400	-700	-8.6%
Baker Ave (south of 2nd St)	12,300	11,900	-400	-3.3%
2nd St (west of Baker Ave)	10,500	9,700	-800	-7.6%
Karrow Ave (south of HWY 93)	8,000	2,700	-5,300	-66.3%
HWY 93 (west of Karrow Ave)	18,300	13,900	-4,400	-24.0%
HWY 93 (east of AS-1)	9,000	10,300	1,300	14.4%
AS-1 (south of HWY 93)	-	10,900	-	-
AS-1 (west of HWY 93)	-	8,900	-	-

This western route alternative was **not carried further** in this Transportation Plan in the form of a recommendation due to the significant environmental impacts associated with its construction, coupled with the lack of providing any significant benefits to the traffic volumes in the downtown core. Costs associated with this alternative were excessively high as well, due to expected right-of-way costs. Also, significant public resistance was expressed relative to this route and by affected residents in the Whitefish Hills development.

○ Alternative Scenario 2 (Western Route Alternative B)

AS-2 consists of a western route that begins at the intersection of MT Highway 40 and Highway 93. The route would then proceed to the northwest to meet with Blanchard Lake where a bridge would be needed to cross the lake. After the bridge, the alternative would head northwest to connect back with Highway 93. Adding this route serves traffic on Highway 93 that does not need to pass through Whitefish for its intended destination. This route causes a notable decrease in traffic volume north of the intersection with MT Highway 40 on Highway 93. There is also a significant traffic volume reduction on Karrow Avenue.

Table 3-12

Alternative Scenario 2 (Western Route Alternative B)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
HWY 93 (north of AS-2)	29,300	25,700	-3,600	-12.3%
13th Street West (west of HWY 93)	4,800	3,900	-900	-18.8%
Spokane Ave just (south of 2nd St)	8,100	7,600	-500	-6.2%
Baker Ave (south of 2nd St)	12,300	12,000	-300	-2.4%
2nd St (west of Baker Ave)	10,500	9,500	-1,000	-9.5%
Karrow Ave (north of AS-2)	5,400	4,600	-800	-14.8%
Karrow Ave (south of HWY 93)	8,000	2,700	-5,300	-66.3%
HWY 93 (west of Karrow Ave)	18,300	13,900	-4,400	-24.0%
HWY 93 (east of AS-2)	9,100	5,500	-3,600	-39.6%
AS-2 (south of HWY 93)	-	6,800	-	-
AS-2 (west of HWY 93)	-	14,900	-	-

This western route alternative was **not carried further** in this Transportation Plan in the form of a recommendation due to the significant environmental impacts associated with its construction, coupled with the lack of providing any significant benefits to the traffic volumes in the downtown core. Significant public resistance was expressed relative to this route and by affected residents in the Whitefish Hills development. Costs associated with this alternative were excessively high as well, due to a crossing of Blanchard Lake and expected right-of-way costs. The route did not relieve traffic volume issues in the downtown core.

○ Alternative Scenario 3 (Western Route Alternative C)

AS-3 is similar to **AS-2** and consists of a route that begins at the intersection of Highway 93 and MT Highway 40. The route then travels northwest along an existing power line easement on the eastern side of Blanchard Lake. The route ends at an intersection with Highway 93. This scenario has similar affects on traffic volumes as **AS-2**. Just like **AS-1** and **AS-2**, this route serves traffic on Highway 93 that does not need to pass through Whitefish, however it does not provide any significant relief to the downtown core in the future. This western route alternative was **not carried further** in this Transportation Plan in the form of a recommendation due to the significant environmental impacts associated with its construction.

Table 3-13

Alternative Scenario 3 (Western Route Alternative C)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
HWY 93 (north of AS-3)	29,300	25,600	-3,700	-12.6%
13th Street West (west of HWY 93)	4,800	3,900	-900	-18.8%
Spokane Ave just (south of 2nd St)	8,100	7,200	-900	-11.1%
Baker Ave (south of 2nd St)	12,300	12,300	0	0.0%
2nd St (west of Baker Ave)	10,500	9,500	-1,000	-9.5%
Karrow Ave (north of AS-3)	5,400	3,900	-1,500	-27.8%
Karrow Ave (south of HWY 93)	8,000	2,500	-5,500	-68.8%
HWY 93 (west of Karrow Ave)	18,300	13,800	-4,500	-24.6%
HWY 93 (east of AS-3)	8,200	9,000	800	9.8%
AS-3 (south of HWY 93)	-	12,600	-	-
AS-3 (west of HWY 93)	-	15,000	-	-

- **Alternative Scenario 4 (Western Route Alternative D)**

AS-4 starts in the same place and follows the same alignment as **AS-2** and **AS-3** until it intersects with Karrow Avenue, where it travels north to intersect with Highway 93. This alternative scenario provides additional south & west connectivity around Whitefish. This connection does lower some traffic volume levels around the downtown area, and most notably traffic volumes on Highway 93 north of the intersection with MT Highway 40. This scenario would cause a significant traffic volume increase on Karrow Avenue however

Although this western route alternative had the most benefits in terms of affecting downtown traffic volume relief out of the four considered alternatives, there are significant hurdles pertinent to its implementation. This includes traffic volume increases to Karrow Avenue, environmental impacts and funding limitations.

Karrow Avenue will be in need of improvements out to the planning horizon (year 2030) based on potential land use changes and resulting growth, however it is not recommended to reconstruct Karrow Avenue in the form of a "Bypass". Significant public resistance was expressed relative to this route and by affected residents along Karrow Avenue.

This western route alternative was **not carried further** in this Transportation Plan in the form of a recommendation.

Table 3-14

Alternative Scenario 4 (Western Route Alternative D)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
HWY 93 (north of AS-4)	29,300	24,800	-4,500	-15.4%
13th Street West (west of HWY 93)	4,800	4,200	-600	-12.5%
Spokane Ave just (south of 2nd St)	8,100	7,400	-700	-8.6%
Baker Ave (south of 2nd St)	12,300	12,300	0	0.0%
2nd St (west of Baker Ave)	10,500	9,600	-900	-8.6%
Karrow Ave (north of Blanchard Lake Dr)	5,400	13,900	8,500	157.4%
Karrow Ave (south of HWY 93)	8,000	8,600	600	7.5%
HWY 93 (east of Karrow Ave)	12,900	11,500	-1,400	-10.9%
AS-4 (west of HWY 93)	-	12,800	-	-

- **Alternative Scenario 5 (Baker Avenue Extension)**

AS-5 consists of a southern extension to Baker Avenue. The extension would start at 19th Street and would head south to connect with J.P. Road; approximately 0.68 miles long. This scenario creates another north south alternative to Highway 93. The model for this scenario shows a significant reduction in traffic volumes on Highway 93 and 19th Avenue with only a modest addition to traffic volumes on Baker Avenue north of 19th Street. This connection was **deemed desirable and was carried forward** in the Transportation Plan (**MSN-3** in **chapter 8**).

Table 3-15

Alternative Scenario 5 (Baker Avenue Extension)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
HWY 93 (north of J P Road)	10,600	9,200	-1,400	-13.2%
HWY 93 (south of 19th St)	35,700	26,300	-9,400	-26.3%
19th St (between Baker Ave and HWY 93)	10,400	2,700	-7,700	-74.0%
Baker Ave (north of 19th St)	10,200	10,500	300	2.9%
AS-5 (south of 19th St)	-	8,200	-	-
AS-5 (west of HWY 93)	-	7,700	-	-

- **Alternative Scenario 6 (13th Street Bridge)**

AS-6 calls for the addition of a bridge across the Whitefish River that would connect 13th Street and Voerman Road. This would allow for better east-west connectivity, especially in the southern portion of the city. 13th Street would see an increase in traffic volumes, while 10th Street traffic volumes would be reduced due to the increase in alternate east-west

connection roads. This connection was **deemed desirable and was carried forward** in the Transportation Plan (**MSN-10** in **chapter 8**).

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Table 3-16

Alternative Scenario 6 (13th Street Bridge)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
13th Street (east of HWY 93)	9,600	11,200	1,600	16.7%
Shady River Ln (south of Voerman Rd)	1,500	1,600	100	6.7%
Voerman Rd (north of AS-6)	4,900	3,500	-1,400	-28.6%
Voerman Rd (east of AS-6)	4,700	5,300	600	12.8%
Columbia Ave (north of 13th St)	9,600	9,600	0	0.0%
10th St (between Columbia Ave and Park Ave)	5,000	3,400	-1,600	-32.0%
AS-6 (between 13th St and Voerman Rd)	-	3,100	-	-

- **Alternative Scenario 7 (7th Street Extension)**

AS-7 begins at the eastern end of 7th Street. The route would extend 7th Street to the east across Cow Creek, then to the south to connect with Voerman Road at the intersection with Monegan Road. This scenario adds connection to the south eastern side of Whitefish. The result of this scenario would cause a decrease in traffic volumes on 8th Street, Voerman Road, and 7th Street, but would increase traffic volumes on Pine Avenue and Monegan Road. This connection was **deemed desirable and was carried forward** in the Transportation Plan (**MSN-5** in **chapter 8**).

Table 3-17

Alternative Scenario 7 (7th Street Extension)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
8th St (between Somers Ave and Park Ave)	3,000	1,900	-1,100	-36.6%
Pine Ave (north of 7th St)	3,400	4,900	1,500	44.1%
Voerman Rd (west of Monegan Rd)	4,700	3,800	-900	-19.1%
Voerman Rd (east of Monegan Rd)	9,400	8,300	-1,100	-11.7%
Monegan Rd (south of Voerman Rd)	5,700	6,700	1,000	17.5%
7th St (west of Pine Ave)	3,600	2,700	-900	-25.0%
AS-7 (east of 7th St and north of Voerman Rd)	-	4,700	-	-

○ Alternative Scenario 8 (Kalner Lane Extension)

AS-8 creates an extension to Kalner Lane that heads north to cross Voerman Road. The extension would keep heading north until it connects with Armory Road at the intersection with Peregrine Lane. This scenario would call for a bridge to be built in order to cross the Whitefish River. This route would serve to connect the southern and eastern portions of Whitefish. The results of this scenario would be a decrease in traffic volumes on Highway 93 north of MT Highway 40, as well as a decrease in traffic volumes on Voerman Road. The scenario would also increase traffic on Armory Road and Monegan Road to the west of the extension. This connection was **deemed desirable and was carried forward** in the Transportation Plan (**MSN-6** in **chapter 8**).

Table 3-18

Alternative Scenario 8 (Kalner Lane Extension)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
MT HWY 40 (west of Kalner Ln)	15,500	13,900	-1,600	-10.3%
HWY 93 (north of MT HWY 40)	29,300	24,400	-4,900	-16.7%
Kalner Ln (north of MT HWY 40)	6,100	6,300	200	3.3%
Monegan Rd (west of AS-8)	4,300	5,900	1,600	37.2%
Monegan Rd (east of AS-8)	4,300	3,000	-1,300	-30.2%
Voerman Rd (west of AS-8)	9,400	8,300	-1,100	-11.7%
Voerman Rd (east of AS-8)	9,400	5,800	-3,600	-38.3%
Armory Rd (west of AS-8)	7,600	12,700	5,100	67.1%
AS-8 (south of Armory Rd)	-	10,200	-	-
AS-8 (north of MT HWY 40)	-	6,400	-	-

○ Alternative Scenario 9 (Texas/Columbia Railroad Crossing)

AS-9 calls for an elevated railroad crossing to be added to connect Texas Avenue with Columbia Avenue. This would create a link between parts of Whitefish to the south of the railroad tracks and the parts to the north. Currently the only links across the railroad tracks are the viaduct on 2nd Street, and the East 2nd Street ground-level railroad crossing. This scenario creates a substantial decrease in traffic volumes along the 2nd Street viaduct and East 2nd Street railroad crossing, as well as reducing traffic volumes along Edgewood Place east of Texas Avenue. Increases in traffic would most notably occur on Columbia Avenue north of 2nd Street and Edgewood Place, west of Texas Avenue.

This connection was **not carried further in** this Transportation Plan, however, due to its significant financial implications and impacts to the surrounding neighborhoods. This potential crossing would occur over many rail lines and would not serve any future development in the community that is likely to happen to the northeast or southeast of its current limits.

Table 3-19

Alternative Scenario 9 (Texas/Columbia Railroad Crossing)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
2nd St R/R crossing	27,500	20,900	-6,600	-24.0%
2nd St (west of Columbia Ave)	8,400	7,700	-700	-8.3%
East 2nd St R/R crossing	12,500	6,300	-6,200	-49.6%
Columbia Ave (north of 2nd St)	1,900	5,500	3,600	189.5%
Edgewood Pl (west of Texas Ave)	9,100	12,100	3,000	33.0%
Edgewood Pl (east of Texas Ave)	12,800	7,200	-5,600	-43.8%
Texas Ave (north of Edgewood Pl)	6,700	7,100	400	6.0%
AS-9 (south of Edgewood Pl)	-	13,700	-	-

- **Alternative Scenario 10 (Cow Creek Railroad Crossing)**

AS-10 is an extension of Kalner Lane to the north to intersect with Armory Road. The route then continues along the existing Armory Road to intersect with 2nd Street. The scenario then calls for an elevated railroad crossing to connect with East Edgewood Drive. The model for this alternative scenario shows substantial decreases in traffic volumes along E Edgewood Drive east of **AS-10**, East 2nd Street to the east of Armory Road, Armory Road to the East of **AS-10**, and a somewhat more modest decrease along Highway 93 just north of MT Highway 40. Traffic volume increases are shown on Monegan Road to the west of **AS-10**, E Edgewood Drive west of **AS-10**, and a significant increase on Armory Road along **AS-10**. This connection was **deemed desirable and was carried forward** in the Transportation Plan (**MSN-6** in **chapter 8**).

Table 3-20

Alternative Scenario 10 (Cow Creek Railroad Crossing)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
HWY 93 (north of MT HWY 40)	29,300	25,100	-4,200	-14.3%
MT HWY 40 (west of Kalner Ln)	15,500	14,000	-1,500	-9.7%
Kalner Ln (north of MT HWY 40)	6,100	6,500	400	6.6%
Monegan Rd (west of AS-10)	4,300	5,800	1,500	34.9%
Monegan Rd (east of AS-10)	4,300	3,300	-1,000	-22.3%
Armory Rd (east of AS-10)	7,600	5,000	-2,600	-34.2%
Armory Rd (along of AS-10)	7,600	15,900	8,300	109.2%
E 2nd St (west of Armory Rd)	13,100	11,500	-1,600	-12.2%
E 2nd St (east of Armory Rd)	12,900	6,200	-6,700	-51.9%
E Edgewood Dr (west of AS-10)	13,900	16,100	2,200	15.8%

E Edgewood Dr (east of AS-10)	13,900	4,200	-9,700	-69.8%
AS-10 (Cow Creek R/R Crossing)	-	12,500	-	-
AS-10 (south of Armory Rd)	-	13,100	-	-
AS-10 (north of MT HWY 40)	-	6,900	-	-

- **Alternative Scenario 11 (Armory Road Extension)**

AS-11 consists of extending Armory Road to the south along Reimer Lane to connect with MT Highway 40, and the addition of an extension heading north to connect Armory Road to East 2nd Street at the railroad crossing. This scenario provides additional eastern and southeastern connectivity. The results show a decrease in traffic volumes along Highway 93 north of MT Highway 40, Dillon Road, Voerman Road, E Edgewood Drive, and Armory Road west of **AS-11**. Significant traffic volume increases occur along Armory Road east of **AS-11** and along Reimer Lane, which is part of **AS-11**.

This connection was **not carried further** in this Transportation Plan, however, due to its difficulty in implementation and the benefits likely to be realized with **AS-10** and the associated recommended project (**MSN-6** in **chapter 8**).

Table 3-21

Alternative Scenario 11 (Armory Road Extension)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
HWY 93 (north of MT HWY 40)	29,300	24,700	-4,600	-15.7%
MT Hwy 40 (west of AS-11)	13,200	14,000	800	6.1%
Dillon Rd (north of MT HWY 40)	4,500	2,600	-1,900	-42.2%
Voerman Rd (west of Armory Rd)	7,600	7,200	-400	-5.3%
Voerman Rd (east of Armory Rd)	8,800	6,100	-2,700	-30.7%
E Edgewood Dr (east of AS-11)	10,400	8,600	-1,800	-17.3%
Armory Rd (west of AS-11)	7,400	4,600	-2,800	-37.8%
Armory Rd (east of AS-11)	7,400	13,500	6,100	82.4%
Reimer Ln (south of Armory Rd)	1,400	7,100	5,700	407.1%
AS-11 (south of Reimer Ln)	-	8,100	-	-
AS-11 (north of MT HWY 40)	-	7,400	-	-

○ Alternative Scenario 12 (7th Street Bridge)

AS-12 requires the addition of a bridge across the Whitefish River to connect 7th Street at the intersections of Baker Avenue and Kalispell Avenue. This scenario creates added connectivity between the east and west sides of Whitefish across the Whitefish River. Overall traffic volume changes are minimal throughout the network under this scenario. However, it is felt that this scenario would help to create better flow throughout the system. This connection was **deemed desirable and was carried forward** in the Transportation Plan (**MSN-4** in **chapter 8**).

Table 3-22

Alternative Scenario 12 (7th Street Bridge)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
13th St W (west of HWY 93)	4,800	3,100	-1,700	-35.4%
HWY 93 (south of AS-12)	14,100	15,100	1,000	7.1%
HWY 93 (north of AS-12)	14,100	11,900	-2,200	-15.6%
2nd St (west of Spokane Ave)	11,100	9,300	-1,800	-16.2%
Baker Ave (north of 7th St)	11,800	13,000	1,200	10.2%
Karrow Ave (south of 7th St)	6,500	5,600	-900	-13.8%
Karrow Ave (north of 7th St)	8,600	8,500	-100	-1.2%
W 7th St (east of Karrow Ave)	11,400	10,800	-600	-5.3%
W 7th St (west of Baker Ave)	10,400	11,400	1,000	9.6%
AS-12 (between Baker Ave and Spokane Ave)	-	10,700	-	-

○ Alternative Scenario 13 (Wisconsin Avenue Improvements)

AS-13 calls for Wisconsin Avenue to be upgraded to a 3-lane urban design standard. This would create a center left-turn bay. This allows Wisconsin Avenue to have a higher vehicle capacity and better flow characteristics. The model of this scenario shows modest decreases in traffic volumes in the area, with moderate increases along Wisconsin Avenue. This connection was **deemed desirable and was carried forward** in the Transportation Plan (**MSN-9** in **chapter 8**).

Table 3-23

Alternative Scenario 13 (Wisconsin Avenue Improvements)

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
Edgewood Pl (west of Wisconsin Ave)	11,200	9,200	-2,000	-17.9%
Edgewood Pl (east of Wisconsin Ave)	10,800	9,400	-1,400	-13.0%
Parkway Ave (west of Wisconsin Ave)	3,000	1,300	-1,700	-56.7%
Colorado Ave (east of Wisconsin Ave)	9,100	6,600	-2,500	-27.5%
Reservoir Rd (east of Lakeshore Dr)	6,800	5,800	-1,000	-14.7%
Wisconsin Ave (north of Edgewood Pl)	12,800	16,000	3,200	25.0%
Wisconsin Ave (south of Colorado Ave)	15,000	18,100	3,100	20.7%
E Lakeshore Dr (east of Murdock Ln)	19,200	18,300	-900	-4.7%

○ Alternative Scenario 14 (a) (NE Extension to Texas Avenue (a))

AS-14 (a) creates a connection between Texas Avenue and Wisconsin Avenue. This scenario allows for better connectivity for the northern part of Whitefish. This scenario creates substantial traffic volume drops along Denver Street, and more moderate drops along Wisconsin Avenue and Colorado Avenue. This connection was **deemed desirable and was carried forward** in the Transportation Plan (**MSN-8** in **chapter 8**).

Table 3-24

Alternative Scenario 14 (a) (NE Extension to Texas Ave (a))

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
Edgewood Pl (east of Wisconsin Ave)	10,800	9,800	-1,000	-9.3%
Wisconsin Ave (south of AS-14 (a))	13,000	10,600	-2,400	-18.5%
Denver St (east of Wisconsin Ave)	3,200	100	-3,100	-96.9%
Denver St (west of Texas Ave)	4,600	200	-4,400	-95.7%
Colorado Ave (north of Denver St)	10,600	9,100	-1,500	-14.2%
AS-14 (a) (east of Wisconsin Ave)	-	4,300	-	-
AS-14 (a) (west of Texas Ave)	-	4,500	-	-

○ Alternative Scenario 14 (b) (NE Extension to Texas Avenue (b))

AS-14 (b) consists of the Texas/Columbia Railroad Crossing in **AS-9** and adds it to the scenario described in **AS-14 (a)**. These combined scenarios provide improved connectivity for northern Whitefish. The results indicate drops in traffic volumes along the 2nd Street viaduct, along Edgewood Place east of Wisconsin Avenue and east of Texas Avenue, along the East 2nd Street railroad crossing, and along Denver Street west of Texas Avenue. Traffic

volume increases occur along Edgewood Place west of Texas Avenue and along Columbia Avenue north of East 2nd Street. This connection was **not carried further** in this Transportation Plan.

Table 3-25

Alternative Scenario 14 (b) (NE Extension to Texas Avenue (b))

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
2nd St R/R Crossing	27,500	20,900	-6,600	-24.0%
Edgewood Pl (east of Wisconsin Ave)	10,800	7,000	-3,800	-35.2%
Edgewood Pl (west of Texas Ave)	9,100	11,900	2,800	30.8%
Edgewood Pl (east of Texas Ave)	12,800	7,100	-5,700	-44.5%
Columbia Ave (north of 2nd St E)	1,900	5,500	3,600	189.5%
East 2nd St R/R crossing	12,500	6,300	-6,200	-49.6%
Denver St (west of Texas Ave)	4,600	200	-4,400	-95.7%
Texas Ave (north of Edgewood Pl)	6,700	7,400	700	10.4%
AS-12 (b) (east of Wisconsin Ave)	-	4,600	-	-
AS-12 (b) (west of Texas Ave)	-	4,700	-	-

- **Alternative Scenario 15 (a) (NE Extension to Cow Creek (a))**

AS-15 (a) consists of an extension to Denver Avenue to the east and then south to intersect with East Edgewood Drive. This extension provides added connectivity for northeastern Whitefish. The model shows significant traffic volume decreases along Texas Avenue south of Denver Street and along E Edgewood Drive west of **AS-15**. Traffic volume increases would result along Denver Street. This connection was **deemed desirable and was carried forward** in the Transportation Plan (**MSN-7** in **chapter 8**).

Table 3-26

Alternative Scenario 15 (a) (NE Extension to Cow Creek (a))

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
Denver St (east of Wisconsin Ave)	3,200	3,600	400	12.5%
Denver St (west of Texas Ave)	4,600	6,400	1,800	39.1%
Colorado Ave (south of Denver St)	9,300	7,500	-1,800	-19.4%
Texas Ave (south of Denver St)	4,600	200	-4,400	-95.6%
E Edgewood Dr (west of AS-15)	13,900	6,900	-7,000	-50.4%
E Edgewood Dr (east of AS-15)	13,900	13,100	-800	-5.8%
AS-15 (a) (extension between Denver St and E Edgewood Dr)	-	6,200	-	-

○ Alternative Scenario 15 (b) (NE Extension to Cow Creek (b))

AS-15 (b) consists of the extension to Denver Avenue described in **AS-15 (a)** and includes the Cow Creek Railroad Crossing found in **AS-10**. This scenario provides connectivity between northern and eastern Whitefish. The model indicates that there would be substantial drops in traffic volume on E Edgewood Drive and along the East 2nd Street railroad crossing. The 2nd Street viaduct would see a modest drop while Denver Street would see an increase in traffic volumes. This connection was **not carried further** in this Transportation Plan.

Table 3-27

Alternative Scenario 15 (b) (NE Extension to Cow Creek (b))

Location	Year 2030 Volume with No Action	Year 2030 Volume with Alternative	Change in Volume	Percent Change
2nd Street R/R Crossing	27,500	24,800	-2,700	-9.8%
East 2nd Street R/R Crossing	12,500	5,100	-7,400	-59.2%
Armory Road (South of E 2nd St)	7,600	7,700	100	1.3%
E Edgewood Dr (east of AS-15)	13,900	5,100	-8,800	-63.3%
E Edgewood Dr (west of AS-15)	13,900	9,300	-4,600	-33.1%
Denver Street (east of Wisconsin Ave)	3,200	4,200	1,000	31.3%
AS-15 (b) (east of Texas Ave)	-	6,400	-	-
AS-15 (b) (Cow Creek R/R Crossing)	-	11,000	-	-

3.8 TRAFFIC MODEL DEVELOPMENT CONCLUSIONS

The alternative scenarios modeled, and described above, are reflective of major street network (MSN) projects that may or may not have considerable value to the transportation conditions in the community. Most of the alternative scenarios modeled will be carried forward later in the Plan in the form of specific recommendations. These are primarily found in **Chapter 8**. A few of the scenarios do not appear to have substantial value, so will not be considered further. Ultimately, the recommended projects defined in **Chapter 8** will transform into what is known as the community's "Recommended Major Street Network". This network is shown graphically in **Chapter 8**, along with travel demand model volume outputs. The "Recommended Major Street Network" is the future transportation system network that the community should be planning towards as land use changes occur over the planning horizon (year 2030).